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Network Interconnection and Takings

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# NETWORK INTERCONNECTION AND TAKINGS

Adam Candeub

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† Assistant Professor of Law, Michigan State University College of Law (effective Fall 2004). I thank Christopher Barnekov for his incisive critique, Jay Atkinson for first setting me onto this path, Milton Mueller for his kind comments and encouragement, Xia Mei for her tremendous assistance, Will Cox for his intelligent input, and H.W. Candeub for her editorial advice. Above all, I thank my wife, Julie Taiber, who understands interconnection with the (s)ages. In the interest of full disclosure, I note that I worked on numerous of the proceedings discussed herein while an attorney at the Federal Communications Commission, including the Intercarrier Reciprocal Compensation for ISP-Bound Traffic Order on Remand, the Unified Intercarrier Compensation Regime Notice of Proposed Rulemaking, numerous “271 applications,” and several access charge disputes.
INTRODUCTION

"Only connect . . ."

E.M. Forster, Howards End

For a hundred years, courts and regulators have assumed that when a telephone company terminates a call originating on another network, the originating company "uses" the terminating company's wire. Courts have determined, therefore, that companies terminating or accepting calls from other networks must receive compensation to avoid a taking of its private property. Consequently, when regulators mandate interconnection, they generally require payments between carriers, generically called intercarrier payments, to compensate such interconnection.

Mandated intercarrier payments have brought serious regulatory uncertainty to efforts to foster telecommunications competition—from the 1914 Kingsbury Commitment, to MCI's entrance into long-distance in the 1980s, to the Telecommunications Act of 1996's local telephony

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2. See infra note 44.
3. See infra Section I.
4. This Article uses the term "intercarrier payments" to refer generically to all payments between carriers, including long-distance access charges, reciprocal compensation between local telephone companies under the Telecommunications Act of 1996, and settlement charges in international calling. See In re Access Charge Reform, 15 F.C.C.R. 12,962, 12,965-70 (May 31, 2000) (explaining that the term "access charges" refers to the payments made by long-distance companies to local exchanges pursuant to their interconnection regime); 47 U.S.C. §§ 251(c), 252(d) (2000) (describing local interconnection payments); In re Int'l Settlement Rates, 12 F.C.C.R. 19,806, 19,806-07 (Aug. 18, 1997) (describing the international settlement system for calling).
deregulation. Largely recovering costs in a manner different from the way they are incurred, intercarrier payments are inherently inefficient and, to a large degree, arbitrary, giving regulators broad powers to shape the market, thereby creating significant business uncertainty. Intercarrier payments continue to form one of the most controversial aspects of communications law. Even after two trips to the Supreme Court, it still has left open the question whether TELRIC (Total Element Long Range Incremental Cost), the Telecommunications Act of 1996's local intercarrier payment regime for unbundled network elements (UNEs), is an unconstitutional taking of property. This unending legal uncertainty perpetuates the stagnation endemic to the communications industry today.

If the takings assumptions were shown to be incorrect, if intercarrier payments are not the only way to deal with the costs interconnection imposes, then the legal need for intercarrier payments would disappear and a more competitively neutral, less regulatory regime could take their place, drastically changing the face of communications law and policy. This Article argues that the takings/intercarrier payment assumption is, in fact, faulty. Interconnection does not necessarily involve one company “using” another’s network in a manner requiring one network to pay the other. Indeed, such assertion is economically suspect because interconnection confers a benefit to both networks—that of a larger calling universe, i.e., network effects—which renders each network more valuable. Rather than

5. As discussed below, efforts to introduce or foster competition had, as an essential feature, a government-imposed access charge regime. In the 1910s, the Kingsbury Commitment required independent phone companies to pay “tariffs” to interconnect with Bell-affiliated long-distance services. HARRY B. MACMEAL, THE STORY OF INDEPENDENT TELEPHONY 204-07 (1934) (reprinting the commitment and specifying the “connection charge of ten cents for each message which originates on its lines and is carried in whole or in part over the lines of the Bell system”). After the AT&T break-up, the Commission created the long-distance access charge regime, specifying the amounts that long-distance companies must pay originating and terminating local exchanges. In re MTS & WATS Mkt.-Structure, 93 F.C.C.2d 241 (Feb. 28, 1983). The long-distance access charge regime served the dual purpose of “paying” for interconnection as well as maintaining the subsidization levels of local phone rates. GERALD W. BROCK, TELECOMMUNICATION POLICY FOR THE INFORMATION AGE 173-94 (1994). The Telecommunications Act of 1996, which deregulated local telephony, requires access charge payments between incumbent local Bell monopolies and new entrants (competitive local exchanges or CLECs). 47 U.S.C. §§ 251(c)(2)(D), 252(d)(2).


7. See infra Section III.B.

8. See David A. Balto, Networks and Exclusivity: Antitrust Analysis to Promote Network Competition, 7 GEO. MASON L. REV. 523, 524 (1999). Balto states:
The value of a network to a consumer depends on the total number of users and
requiring networks to pay each other on a per call basis, interconnection regimes should only require payment of those costs incremental to establishing interconnection. Simple, quasi-Coasian (a term explained infra) interconnection regimes do that, by allocating costs of facilities incremental to interconnection between carriers, not trying to calculate the cost that a call from one network imposes on another. Once interconnection is established, telephone companies would exchange traffic without intercarrier compensation and recover the costs of their networks from end-users, just as bailers, telegraphs, e-mails, and, historically, most common carriers did.

Implicitly adopting this understanding of network property rights, economists recently have proposed interconnection regimes (falling under the "bill and keep" rubric) that split the costs of interconnection in a competitively neutral manner, thereby producing an efficient, quasi-Coasian result and that have no provision for intercarrier payments. The FCC is currently considering these proposals. This Article contends that

the identities of other specific users. The larger the network, the greater the number of consumers who will join it and conversely, the smaller the network, the less attractive it will be to consumers. For example, a telephone network becomes more valuable as additional customers are connected to it.


9. See infra Section III.B.

10. See infra Section II.B. This proposal would arguably return telephony interconnection regimes to those used historically for other common carriers and network industries. *Id.*. Under common law, common carriers must accept traffic from all, including competitors: telegraph companies could interconnect by sending their delivery boys to competitor companies, railroads unloaded freight and re-loaded it to connecting carriers, and phone companies at one time transmitted messages to non-interconnected companies by calling these company's central offices, which then called their customer, who then went to a phone belonging to the calling party's phone company—a convoluted, but common practice in the early 1900s. *Id.*, see infra notes 106-110 and accompanying text. Although this type of interconnection involves carriers accepting traffic from other carriers, it poses no takings issues because general, end-user rates compensated each company.


12. In re Developing a Unified Intercarrier Comp. Regime, 16 F.C.C.R. 16,822, 16,822-23 (Sept. 19, 2001). As discussed infra, voice over internet protocol ("VoIP"), which threatens the entire long-distance access charge system by using the internet backbone to complete long distance calls, has brought great urgency to this proceeding. As
such interconnection does not constitute a taking. Finally, this approach to interconnection undercuts to some degree the notion that mandatory interconnection must be compensated through the efficient component pricing rule, a notion frequently and prominently forwarded.  

Section I examines the origins of the belief that a phone company that terminates a call from another must receive compensation from the originating carrier to avoid a taking of private property. In the early part of this century, courts faced the problem of applying the traditional right of interconnection (which this Article terms the “right of hand-off”)—that required ferries, railroads, telegraphs, and the like to receive traffic from competitors as well as members of the public—to the new technology of telephony. Most common carriers, like railroads, or even telegraphs, could interconnect with competitors in the same manner as they received traffic from the public—ferries would deliver traffic to public docks where they would connect (“hand-off”) with other ferries, railroads did the same at terminals and stations, and telegraphs could interconnect by sending delivery boys to competitors’ offices. In marked contrast to these technologies, telephone companies posed an interconnection challenge because they required physical facilities (i.e., specially connected switchboards) to interconnect efficiently with competitors; simple hand-off of press time, industry is in negotiation over the future of intercarrier compensation. See NARUC Develops Proposals On Intercarrier Compensation, TELECOMMUNICATIONS REPORTS, Mar. 15, 2004, available at 2004 WL 69682759 (describing the negotiations of the large carriers and the reaction of small, rural carriers).


interconnection was not feasible.\textsuperscript{15}

Providing a thorough analysis of the telephone common law interconnection cases, Section I shows that these cases never really resolved this central challenge of telephone interconnection. A dominant approach—which most courts and commentators view as definitive—attempted to resolve this problem by destroying the right and obligation of hand-off for telephone companies.\textsuperscript{16} They reasoned because telephone interconnection required special facilities, such facilities’ costs could not simply be imposed without involving a taking of private property.\textsuperscript{17} If regulators then mandated interconnection, this cost must be recovered through intercarrier payments.\textsuperscript{18} This approach creates a de facto right—if no intercarrier payments are offered—to refuse interconnection, something totally new to common carriage.\textsuperscript{19}

Courts were not unanimous in this conclusion. Some realized that by making competitors pay for the right to interconnect—rather than passing traffic along and having end-users bear the cost—they were destroying a basic right of common carriage enjoyed in other industries.\textsuperscript{20} Some of these courts stated that interconnection under certain circumstances was a right, but could never solve the puzzle of how to maintain the right of hand-off without imposing costs on interconnecting carriers.\textsuperscript{21} Finally, a third approach required unconnected telephone companies to transmit messages by calling their central offices, which then called their customer, who then went to a phone belonging to the calling party’s phone company.\textsuperscript{22} This preserved the right of hand-off and presented no takings issues but was hardly practical.\textsuperscript{23}

Drawing on basic microeconomic pricing theory, Section II offers an insight to the puzzle. As the early cases established, “hand-off” interconnection does not present a takings problem.\textsuperscript{24} Why not? Such interconnection involves one network using another network and acquiring benefit from it, just as railroads that can interconnect with others can provide a more valuable service than they could individually.\textsuperscript{25}

\begin{itemize}
\item \textsuperscript{15} See infra Section III.
\item \textsuperscript{16} See infra Section I.B.2.a.
\item \textsuperscript{17} Id.
\item \textsuperscript{18} Id.
\item \textsuperscript{19} Id.
\item \textsuperscript{20} See infra Section I.B.2.b.
\item \textsuperscript{21} Id.
\item \textsuperscript{22} See infra Section I.B.2.c.
\item \textsuperscript{23} Id.
\item \textsuperscript{24} See infra Section II.B.
\item \textsuperscript{25} Id.
\end{itemize}
to use the language of modern takings law, it also involves a physical invasion, i.e. one phone company must accept on its physical property the telegraph or telephone lines of another. Why did not the early cases not find hand-off interconnection a taking? Section II argues that hand-off interconnection is not a taking because the rate charged to the public—either to consumers or the interconnecting competitor—is designed to adequately recover all costs. In other words, if a common carrier wishes to stay in business, a rate will likely recover the incremental cost of the service provided and make some contribution to common costs. As a result, mandatory hand-off interconnection would not constitute a taking. On the other hand, physical interconnection imposes new capital costs that a court cannot assume the general rate will recover. Because an interconnecting carrier’s rate may not be designed to recover these new fixed costs, the common law courts were right in presuming that physical interconnection without compensation may be a taking.

The key question is how interconnection’s imposed costs, costs that may not be recovered in a network’s existing general rate, may be compensated to avoid a taking. Intercarrier payments are one answer. They assume that telephone companies have no right to interconnection whatsoever and, therefore, if government mandates interconnection, the company requesting interconnection must compensate the interconnecting company for the cost that the call imposes on the terminating network. But, intercarrier payments’ logic is contrary to traditional common carriage law. Why? Because under such law, once the originating carrier presented traffic to the terminating carrier, the originating carrier did not have to pay the terminator. Rather, the terminating carrier would recover the cost of the traffic from either the sender or recipient, not another carrier.

Intercarrier payments present intractable economic problems that have beset telecommunication regulation for a century. As discussed below, calculating the cost one network imposes on another is incredibly complex, and, due to the problem of allocating common costs, economic theory does not provide one correct answer. Lobbying, politicization, and agency-

26. Id.
27. Id.
28. Id.
29. Id.
30. Id.
31. Id.
32. Id.
33. Id.
34. Id.
35. See infra Section III.A.
capture further distort the calculation. As a result, intercarrier payments can never be non-controversially set. To illustrate these failings, three important conflicts in intercarrier payment regimes are reviewed: long-distance access charges, the ISP reciprocal compensation dispute, and terminating access monopolies under the Telecommunications Act of 1996. \textsuperscript{36}

Section III argues that there is another solution to the question of how to recover the costs of physical interconnection, which is currently under consideration by the FCC. Rather than assume that the originating carrier must pay for the cost imposed on the terminating network, assume that the originating carrier must only pay to get the call to the terminating carrier’s network; just as a telegraph company must simply get the telegram to the interconnecting telegraph company’s office.\textsuperscript{37} In other words, apply the forgotten right of hand-off, but compensate for the cost incremental to physical interconnection. Drawing on recent quasi-Coasian theories of interconnection, Section III points out that if parties negotiated on how to bear this cost, they would likely split it in some fashion because physical interconnection provides both firms with the benefit of a larger, interconnected network (“network effects”) which are, on the whole, more valuable. Thus, carriers—regardless of which one has the “right to interconnection”—would interconnect \textit{without} intercarrier compensation if the burden (cost) of interconnection were allocated between them so that its benefit outweighed its cost. The cost of a call would be recovered from end-users who would presumably pay for a more valuable, bigger, though more expensive network. As a result, because carriers would experience no economic damage from interconnection, the first step of any takings claim is never reached.\textsuperscript{38} Further, because carriers could recover the interconnection costs, both the cost of physical interconnection as well as the incremental cost of each call, from their own end-users, such interconnection regimes are not “confiscatory” under the takings standard applicable to utilities.\textsuperscript{39}

\textsuperscript{36} See infra Section III.

\textsuperscript{37} Id.

\textsuperscript{38} Pa. Coal Co. v. Mahon, 260 U.S. 393, 415 (1922) (“the general rule at least is that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking”); see also \textsc{John E. Nowak \& Ronald D. Rotunda}, \textsc{Constitutional Law} \S 11.12, at 478-92 (6th ed. 2000).

\textsuperscript{39} There is a distinct line of Supreme Court cases that deal specifically with regulated utilities. \textsc{E.g.}, Duquesne Light Co. v. Barasch, 488 U.S. 299 (1989); Permian Basin Area Rate Cases, 390 U.S. 747 (1968); Mkt. St. Ry. v. R.R. Comm’n of Cal., 324 U.S. 548 (1945). As discussed below, these cases do not directly bear on the question of whether interconnection constitutes a taking \textit{in deregulated} utilities markets but, as Section V
Finally, Section IV places this argument in its scholarly setting. Numerous academics, most notably Lawrence Lessig in his justly famous The Future of Ideas, have called for open access regimes for cable systems. They have not explained fully how to pay for it, a point which this Article argues is a central aspect of any interconnection regime. On the other hand, advocates of the efficient component pricing rule (ECPR), most notably J. Gregory Sidak, Daniel F. Spulber, and now Christopher Yoo, have advocated for pricing access to include the cost of such access as well as the opportunity cost which deregulation eliminates, i.e., the revenue that incumbent monopolists would have received in the absence of competition. In Access to Networks: Economic and Constitutional Connections, Spulber and Yoo argue that ECPR-based intercarrier payments are necessary constitutionally, if no market price exists, as compensation for mandatory interconnection. This Article argues that Spulber and Yoo, in fact, identify both the wrong costs that interconnection imposes and the wrong parties to bear these costs, and therefore recommend a compensation regime that requires intercarrier payments (and their concomitant bureaucratic and economic intractability) that would incorrectly compensate the incumbent monopolists. On the other hand, quasi-Coasian interconnection satisfies constitutional requirements without intercarrier payments and their ineluctable intractability.

I. COMMON LAW, COMMON CARRIAGE, AND COMMON MISCONCEPTIONS

It is a hundred year old chestnut of communications law that mandatory interconnection is not a right under common law, and, as a corollary, regulators when mandating interconnection must also mandate intercarrier payments. Modern commentators assume this truth to be

41. Spulber & Yoo, supra note 13, at 906; Sidak & Spulber, Deregulation, supra note 13, at 129; Sidak & Spulber, The Tragedy of the Telecommons, supra note 13, at 1087-90; Sidak & Spulber, Givings. Takings, supra note 13, at 1096-1101; Sidak & Spulber, Deregulatory Takings, supra note 13, at 980-87.
42. Spulber & Yoo, supra note 13, at 958.
43. See Section IV.
44. Okla.-Ark. Tel. Co. v. S.W. Bell Tel. Co., 45 F.2d 995, 997 (8th Cir. 1930) ("It must further be conceded that, at common law, a telephone company owes no duty to make physical connections with other telephone companies."); Memphis Tel. Co. v. Cumberland Tel. & Tel. Co., 231 F. 835, 840 (6th Cir. 1916) ("[T]he making and maintenance of a connection between two telephone companies in the absence of a contract between them..."
almost self-evident.\textsuperscript{45} For instance, Sidak and Spulber, prolific writers in

\textsuperscript{45} E.g., James B. Speta, \textit{A Common Carrier Approach to Internet Interconnection}, 54 \textit{Fed. Comm. L.J.} 225, 258 (2002) ("[T]he common law imposed no obligation on railroads (or other carriers) to interconnect with the lines of other carriers or to establish joint or through rates for services... There was no obligation to establish either a physical connection or a joint business operation."); see also Annotation, \textit{Right and Duty of Telephone Companies to Make Physical Connections of Exchanges or Lines}, 11 A.L.R. 1204, 1204 (1921) ("The courts are agreed that at common law telephone companies... are not subject to control and regulation to the extent of being under the duty of making physical connection with another company, in the
the area, state that it is "clear under the common law of common carriage that a public utilities could not be required to sell interconnection to another carrier."\textsuperscript{46} Similarly, Tom W. Bell claims that Peter Huber, the eminent communications lawyer and writer, "relies on suspect history" for claiming "mandatory interconnection [is] consistent with common law's common carrier doctrine."\textsuperscript{47}

The old chestnut is soft in the center. As an initial matter, the common law of interconnection for telephones is hardly "clear" or "decisive" because there are, in fact, very few cases that ruled on the matter, and the issue was never completely resolved. The common law interconnection issue only became relevant after 1897 when the Bell patent expired and competitive telephony emerged.\textsuperscript{48} Starting around 1904, with South Carolina, states began to pass laws requiring interconnection, and in 1914, the Kingsbury Commitment mandated interconnection nationwide between the independents and AT&T, thereby putting an end to most common law development.\textsuperscript{49} While many view the question of common law interconnection as settled, the question never received extensive judicial treatments, nor did a consistent view on the matter emerge among the federal or state courts.

More significantly, the chestnut is a deceptive simplification. To say that interconnection is not a common law right is wrong. As mentioned above, common carriage law always required a carrier to accept traffic from a competitor if presented in the same manner as other traffic.\textsuperscript{50} Thus, railroads and bailers had to receive traffic from other railroads and bailers if it were presented at a public station or terminal.\textsuperscript{51} Further, no court ever questioned the simple right of interconnection, requiring unconnected carriers to transmit messages. Rather, as at least the early, contemporary commentators made clear, it was the right to special physical interconnection facilities that did not exist under common law.\textsuperscript{52}

\begin{thebibliography}{9}
\bibitem{Sidak} Sidak & Spulber, \textit{Givings, Takings}, supra note 13, at 1085.
\bibitem{Mue} Mue\textsuperscript{ller}, supra note 14, at 43, 119 n.36.
\bibitem{Id} \textit{Id.} at 119 n.36.
\bibitem{Infra} \textit{See infra} notes 98 to 112; \textit{see also} 1 Bruce Wyman, \textit{Public Service Corporations} §§ 514-15 (1911).
\bibitem{SeeInfa} \textit{See infra} notes 98 to 112.
\bibitem{Walter} S. Walter Jones, \textit{A Treatise on the Law of Telegraph and Telephone Companies} § 263, at 362 (1916). Jones stated:
\begin{quote}
The rules laid down elsewhere respecting the connection of lines do not make it the duty of one telephone company to connect with competing lines. The physical
\end{quote}
\end{thebibliography}
First, this Section reviews common carrier law, as it developed in the nineteenth century for such industries as bailers, railroads, and telegraphs. In these industries, courts distinguished between the right to special interconnection facilities and the right of any customer—a member of the public or competitor—to hand-off traffic. These cases, including the Express Cases, which, it is often claimed, undermine the right to interconnection, do not give an absolute right to refuse interconnection with competitors. Rather, common carriers must receive traffic in their established interconnection points from members of the public as well as competitors.

Next, this Section examines how courts applied this earlier common carrier law to telephones. They took three general approaches. First, courts, uncomfortable with imposing the costs of physical interconnection, ruled that it was not a right. Second, a small line of cases recognizes the right of long-distance companies to interconnect with local exchanges. Third, many cases recognize that telephone companies, as common carriers, have the duty to transmit messages, albeit in a convoluted manner. If one telephone company’s subscriber wanted to reach a subscriber of a telephone company with which the first company was not connected, the calling party’s operator would call an operator of the recipient’s telephone company, and that operator would then call the recipient and instruct him or her to go to a public phone belonging to the calling party’s company.

The Section concludes that the common law—far from establishing that interconnection is not a right and that, if mandated, requires intercarrier payments—never resolved basic questions about how common carriage between competing telephone companies is a privilege to be created only as a result of private contract, or in obedience to some constitutional or statutory provision.

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53. See infra Section I.A.
54. 117 U.S. 1 (1886). The Supreme Court consolidated three suits in one decision, known as the Express Cases. Id. at 2.
55. See The Express Cases, 117 U.S. at 2.
56. Id. at 28.
57. See infra Section I.B.2
58. See infra notes 126-138 and accompanying text.
59. See infra notes 139-146 and accompanying text.
60. See infra notes 147-149 and accompanying text.
61. Id.
applies to telephone interconnection.\footnote{62} Fundamentally, the cases never made clear why the costs of physical interconnection as well as the cost of transmitting the call on the terminating network must be borne by the originating carrier through intercarrier payments; as opposed to apportioning the cost of interconnection and requiring networks to recover costs from their end-users that “hand-off” interconnection involves.\footnote{63}

The Section, therefore, questions a fundamental premise of communications law: that mandatory interconnection requires intercarrier payments in order to avoid a taking. As the Article’s subsequent Sections argue, apportioning property rights in this fashion essentially awards a “termination monopoly” to each carrier, allowing it to demand tribute (in the form of intercarrier payments) from all other carriers that wish to contact its subscribers.\footnote{64} Further, intercarrier payments, which recover fixed cost on a per minute basis, are inherently inefficient.\footnote{65} Rather, a less burdensome approach—which would destroy a carrier’s ability to leverage access against competitors—would simply require networks to obtain revenue from their subscribers and apportion the cost incremental to interconnection in proportion to its benefit.\footnote{66}

A. Common Carriers and Interconnection

The law has used the term “common carrier” since the Middle Ages.\footnote{67} Originally an outgrowth of the guild system, common carriage included all sorts of tradesmen.\footnote{68} By the nineteenth century, at least in the United States, courts applied the category largely to those involved in infrastructure-type industries, such as dock owners, toll bridge and road operators, telegraph operators, and perhaps most important for the development of legal doctrine, railroads.\footnote{69}

Common carriers are subject to special regulation. Traditionally, the most important of these regulations was the standard of care to which they were held.\footnote{70} In addition, they cannot discriminate in service, but must charge, as a general rule, everyone the same rate and receive business from

\footnote{62. See infra note 149 and accompanying text.}
\footnote{63. Id.}
\footnote{64. See infra Section III.A.}
\footnote{65. Id.}
\footnote{66. While a carrier might still charge monopolist rates to end-users, in this blessed age, wireless, Internet, and IP telephony could discipline prices.}
\footnote{67. Speta, supra note 45, at 255-56.}
\footnote{68. I Wyman, supra note 52, §§ 5-15, at 5-14.}
\footnote{69. Speta, supra note 45, at 253-55.}
\footnote{70. See id. at 253-54.}
all. 71 Finally, and most important, from a historical perspective, common carriers, as the Supreme Court recognized in the famous Munn v. Illinois case, were subject to rate regulation, ruling that the state could regulate the rates charged by certain grain elevators used in loading grain to railroads. 72

Given the constitutional barriers in regulating business before the Supreme Court changed its mind about such matters in the 1930s, the limits of common carriage were of vital importance for an obvious reason: a common carrier could be regulated in ways in which a non-common carrier could not. 73 Most important, government bodies could set their rates. A tremendous amount of ink therefore was spilled in an attempt to demarcate the boundary between common carriers and non-common carriers during the late nineteenth century and early twentieth century. 74

In Munn, the Court justified common carriage regulation in part because the loading facility had been “affected with a public interest,” relying on a two hundred year old posthumous work by Lord Chief Justice Hale, De Portibus Maris. 75 Hale identified certain businesses as “clothed with a public interest” and consequently subject to stringent government regulation. 76 After Munn, the Court applied the “clothed in public interest” test to a variety of different scenarios, ruling that a grain elevator in North Dakota, fire insurance, housing, and ticket services were sufficiently affected with the public interest. 77

The Supreme Court, however, never could settle what constituted a business affected in the public interest—and consequently could never set the precise boundaries of common carriage. 78 As the dissent in Munn derisively queried, why are grain warehouses so affected and consequently

1. See id. at 253-55.
4. See id. at 254-59.
5. Munn, 94 U.S. at 125-26 (citing Hale, De Portibus Maris, 1 HARG. LAw TRACTS 78 (1776)). The term “common carrier” is somewhat narrower than “businesses affected with a public interest.” See Cherry, supra note 73, at 255-69.
6. Id. at 120 (citing Hale, supra note 75, at 78).
8. Munn, 94 U.S. at 152 (Field, J., dissenting).
susceptible to regulation, but not providers of “calico gown[s]” or “city mansion[s].” The Court toyed with numerous limiting principles. Some decisions state the term applies only to monopolies, but the Court later dismissed that rule. Similarly, the Court rejected the notion that the power rested solely upon of a public franchise of privilege. Chief Justice Taft attempted to formulate the test as “[b]usinesses which though not public at their inception [like those carried under by public grant or historically labeled as common carriage by the common law], may be fairly said to have risen to be such and have become subject in consequence to some government regulation.” Later, the Court stated that “the rule is confined to conveniences made public because the privilege of maintaining them has been granted by government or because there has arisen what may be termed a constructive grant of the use to the public.”

Also seeking a basis to the distinction, contemporary commentators argued for various positions on the limits of common carriage. Breck P. McAllister concludes the term is largely empty, but should yield to “[a] pragmatic approach . . . [that] will bring the process of judicial review into step with new economic problems . . . .” Bruce Wyman stated in his definitive treatise on common carriage, “[i]n all of the business to be discussed in these chapters, competition, although from a legal point of view possible, is from the economic point of view improbable. . . . virtual monopoly will henceforth prevail.” Charles K. Burdick criticized Wyman’s view arguing that common carriage applies to those activities which historically had been provided by the king or under the king’s writ, to activity which the public had assisted the enterprise in some manner; through public spending, a grant of eminent domain authority, the use of public property, or the establishment of a legal monopoly.

79. Id. (Field, J., dissenting).
80. Sinking-Fund Cases, 99 U.S. 700, 747 (1878) (Bradley, J., dissenting); Spring Valley Waterworks v. Schottler, 110 U.S. 347, 354 (1884) (both stating that Munn applies only to monopolies).
81. German Alliance Ins. Co., 233 U.S. at 410 (stating that Brass, 153 U.S. at 402, affirming Munn, “denuded . . . the limiting element which was supposed to beset it—that to justify regulation of a business the business must have a monopolistic character. That distinction was pressed and answered.”).
82. Id. at 411-12.
84. Tyson & Bros., 273 U.S. at 439.
85. E.g., 1 Wyman, supra note 52, § 36, at 30; McAllister, supra note 77, at 790; Charles K. Burdick, The Origin of the Peculiar Duties of Public Service Companies (pts. 1-3), 11 COLUM. L. REV. 514, 616, 743 (1911).
86. McAllister, supra note 77, at 790.
87. 1 Wyman, supra note 52, § 36, at 30.
88. Burdick (pt. 1), supra note 85, at 514-27.
After the New Deal, however, the importance of these debates lessened because the Supreme Court broadened the powers of governmental regulation. The judicial common law of common carriage, however, survived and continues to delineate common carriers’ property rights. These rights are still basic to those industries, like the telephones, which are indisputably common carriers even though courts never clearly defined common carriage.

Most important to this Article’s purposes are the common law rights concerning interconnection which were primarily established in the railroad context. In *Atchison, Topeka & Santa Fe Railroad Co. v. Denver & New Orleans Railroad Co.*, the Court ruled that a railroad does not have the right to demand that another railroad stop at its junction and interchange business there, even if it has established joint junctions with other railroads. Thus, it is clear that a common carrier is under no obligation to establish connections with another carrier. However, the ruling did not upset the established right that if a railroad stops at a junction, it must still accept traffic from all customers, including competitors. Rather, it rested

89. See, e.g., *Nebbia v. New York*, 291 U.S. 502, 537 (1934) (upholding regulated prices in a non-common carriage industry); see also Richard A. Posner, *The Rise and Fall of Administrative Law*, 72 CHI.-KENT L. REV. 953, 957 (1997) (“The original form of the economic critique treated regulation largely as a form of cartelizing, and this proved fruitful for many of the industry-specific regulatory programs, such as the control of price and entry by public utility and common carrier regulation, programs preceding or created by the New Deal.”); Richard A. Epstein, *The Proper Scope of the Commerce Power*, 73 VA. L. REV. 1387, 1442 (1987); see also Cherry, supra note 73, at 260 (“In Nebbia ... the Supreme Court effectively broadened the scope of permissible regulation ... so that the need to prove that a business did or did not fall into the historical classes of businesses affected with a public interest fell into disuse”).

90. See, e.g., *Hockett v. State*, 5 N.E. 178, 183 (Ind. 1886).

91. *Atchison, Topeka & Santa Fe R.R. Co. v. Denver & New Orleans R.R. Co.*, 110 U.S. 667, 682-83 (1884). The Court stated:

Under these circumstances, to hold that, if the Atchison, Topeka & Santa Fe continued to stop at its old station, after the Denver & New Orleans was built, a refusal to stop at the junction of the Denver & New Orleans was an unreasonable discrimination as to facilities in favor of the Denver & Rio Grande Company, and against the Denver & New Orleans, would be, in effect, to declare that every railroad company which forces a connection of its road with that of another company has a right, under the constitution or at the common law, to require the company with which it connects to do a connecting business at the junction, if it does a similar business with any other company under any other circumstances. Such, we think, is not the law.

92. Id.

93. See id. at 681-82 (“The only remaining questions are as to the obligation of the Atchison, Topeka & Santa Fe Company to carry for the Denver & New Orleans when passengers go to, or freight is delivered at, the regular stations, and the prices to be charged. As to the obligation to carry, there is no dispute, and we do not understand it to be claimed
its judgment on the notion that “[a]t common law, a carrier is not bound to carry except on his own line.”

The *Express Cases*, which some commentators have called the most “salient” precedent for common carrier interconnection, are generally (and largely correctly) believed to stand for the proposition that common carriers are not “common carrier[s] of common carriers.” In other words, common carriers need not carry their competitors’ traffic. The *Express Cases* involved express services, which provided special shipping services using their own cars, over tracks owned by other railroad companies. Generally, these service companies contracted with railroads to run on their tracks. Unhappy with the terms they were receiving, several of them sued to gain the same rights to run trains as the railroad’s own trains. The Supreme Court ruled that railroads could exclude the express trains, saying that

> While it has uniformly been the habit of railroad companies to arrange, at the earliest practicable moment, to take one express company on some or all their passenger trains, or to provide some other way of doing an express business on their lines, it has never been the practice to grant such a privilege to more than one company at the same time, unless a statute or some special circumstances made it necessary or desirable.

It was generally concluded that these cases established the principle that common carriers could refuse interconnection.

None of the cases, however, overturned the common law rule that railroads must accept traffic or freight at public junctions and depots from everyone, including competitors. In this way, despite the Supreme Court cases that limited common carriage law, railroads remained interconnecting networks—at least from the consumer perspective. Notice that in *Atchison*, the Court stated that the Atchison, Topeka and Santa Fe Railroad did not have to stop at the junction of Denver and New Orleans Railroad—but the

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94. *Id.* at 680.
96. The *Express Cases*, 117 U.S. 1, 21 (1886).
97. *Id.*
98. *Id.* at 2-3.
99. *Id.*
100. *Id.* at 5-6.
101. *Id.* at 27-28.
other railroad could stop at the Atchison depot and exchange traffic.\textsuperscript{102} Similarly, although the \textit{Express Cases} ruled that railroads did not have to bear competitors' trains, they did not alter the rule that railroads had to bear freight presented by competitors.\textsuperscript{103}

Contemporary commentators recognized neither the \textit{Express Cases} nor \textit{Atchison} altered the “hand-off” right of interconnection. Writing in 1911, Harvard professor Bruce Wyman wrote that a common carrier “may not refuse altogether to have dealing with [competitors], to accept goods from them, for example. . . . it is the duty of the railroad as a common carrier to accept from any person tendering goods.”\textsuperscript{104} This means that a railroad must deliver “certain goods tendered at one point on its line to another point where that line connects with the second carrier.”\textsuperscript{105} Wyman notes that courts adopted this duty from bailers and stagecoaches and applied it to railroads and then later to telegraphs.\textsuperscript{106}

Further, common carriers in the places at which they established interconnection, could never discriminate in the price or terms they charged for goods received from consumers or from competitors.\textsuperscript{107} Wyman quotes an 1839 opinion by Chief Justice Parker of the New Hampshire Supreme Court, dealing with a stage line running from Nashua to Amherst that only took those passengers arriving to Nashua who used a particular firm:

“The defendant might well have desired that passengers at Lowell should take French’s line because it connected with his. But if he had himself been the proprietor of the stages from Lowell to Nashua, he could have had no right to refuse to take a passenger from Nashua, merely because he did not see fit to come to that place in his stage. It was not for him to inquire whether the plaintiff came to Nashua from one town or another, or by one conveyance or another. That the plaintiff proposed to travel onward from that place, could not injuriously affect the defendant’s business; nor was the plaintiff to be punished, because he had come to Nashua in a particular manner.”\textsuperscript{108}

Indeed, federal courts have long recognized the common carrier duty

\textsuperscript{102} \textit{Atchison}, 110 U.S. at 682; see note 95.
\textsuperscript{103} \textit{The Express Cases}, 117 U.S. at 28.
\textsuperscript{104} 1 WYMAN, supra note 52, § 510, at 432.
\textsuperscript{105} 1 id. § 515, at 438.
\textsuperscript{106} 1 id. § 510, at 432; 1 id. § 515, at 438.
\textsuperscript{107} 1 id. § 524, at 447-48.
\textsuperscript{108} 1 id. § 524, at 447 (alteration in original) (quoting Bennett v. Dutton, 10 N.H. 481, at *5 (1839)).
of telephone companies as common carriers to interconnect with all, including non-telephonic competitors, provided such competitors sought interconnection in the manner in which a member of the public did. The issue emerged when telephone companies refused to permit telegraph companies to subscribe to telephone networks. The telephone companies refused because, in the late nineteenth and early twentieth century, they competed against telegraph in long-distance messaging; the prices of long-distance calls were so high that telegraphy offered a competitive alternative. When consumers called their local telegraph office and recited their international telegraph message, the phone company would lose business. Federal courts ruled that as common carriers, phone companies could not refuse interconnection to these competitors.

Applying this precedent to telephone interconnection is vexing. On one hand, a telephone company is a common carrier and should receive calls from all, including competitors, just as railroads receive freight from all. On the other hand, because telephone companies cannot receive traffic efficiently from competitors without special physical interconnection, telephone companies should not have to connect with competitors.

B. Common Carriage and Telephone Interconnection

1. History

In 1894, when the Bell telephone patent lapsed, the first AT&T monopoly, based on its exclusive technology, ended. After its expiration “[a]lmost immediately, an independent telephone movement with its own operating companies, equipment manufactures, publications, and trade associations took shape.” These new telephone companies sought interconnection with AT&T for obvious reasons. AT&T was the only

109. Delaware & A. Tel. & Tel. Co. v. Delaware, 50 F. 677, 679-80 (3d Cir. 1892); Postal Cable Tel. Co. v. Cumberland Tel. & Tele. Co. 177 F. 726, 727 (C.C. Tenn. 1910); Missouri ex rel. Baltimore & Ohio Tel. Co. v. Bell Tel. Co., 23 F. 539, 540 (C.C.E.D. Mo. 1885). This dispute has re-emerged 100 years later with IP telephony and long-distance. Chérie R. Kiser & Angela F. Collins, Regulation on the Horizon: Are Regulators Poised to Address the Status of IP Telephony?, 1 COMMLAW CONSPECTUS 19, 27-30 (2003). Consumers can call their Internet provider (using dial-up or DSL) and place a long-distance call over the Internet, avoiding long-distance charges—just as consumers called the telegraph company and avoided international calling charges. Id. at 20-21. As discussed infra Section III.A., IP telephony may induce a change in intercarrier compensation, as telephone companies could really stop it only by refusing interconnection with the internet, just as they tried to refuse interconnection with the telegraphs.

110. Id. at 100.

111. MUELLER, supra note 14, at 43.

112. Id.; see also MACMEAL, supra note 5, at 24.
company with a national long-distance network, and therefore independents could not have offered long-distance service without interconnection and most likely could not have effectively competed, at least in the long run.\textsuperscript{113}

AT&T, at first, refused interconnection.\textsuperscript{114} Independents brought suits demanding interconnection and, despite the claims of Sidak, Spulber and others, the decisions were somewhat mixed, as discussed below, though on the whole, the courts found no right to physical interconnection.\textsuperscript{115} Despite these rulings, as Milton Mueller has shown, AT&T’s policy changed during the first years of the last century, and it did interconnect, at times, with the independents.\textsuperscript{116}

AT&T’s general unwillingness to interconnect, as well as its growing domination of the telephone industry, did generate federal antitrust regulatory concern.\textsuperscript{117} As mentioned above, starting in 1907, numerous states passed interconnection laws, and in 1914, Department of Justice authorities negotiated with AT&T the Kingsbury Commitment.\textsuperscript{118} This agreement, so named because its terms were set forth in a letter from AT&T Vice President Nathan C. Kingsbury to the Department of Justice, offered, among other things, to open up its long-distance exchanges under rather expensive toll charges.\textsuperscript{119}

Thus, the state interconnection laws and the Kingsbury Commitment essentially ended the common law development of interconnection law, moving it out of judicial control and into the regulatory sphere. With the possible exception of Smith \textit{v.} Illinois Bell Telephone Co.,\textsuperscript{120} federal courts had very little to say on interconnection until 1978 and \textit{MCI Telecommunications Corp. v. FCC}, which opened the door for MCI’s entrance into competitive long-distance.\textsuperscript{121} Nonetheless, the early judicial opinions of the first part of the twentieth century provide the legal

\begin{itemize}
\item \textsuperscript{113} Richard Gabel, \textit{The Early Competitive Era in Telephone Communication, 1893-1920}, \textit{34 LAW & CONTEMP. PROBS.} 340, 343 (1969). “Refusal to connect with independent telephone systems for long-distance telephone service afforded Bell a stronger means of curbing the independent movement. Since Bell was the pioneer in this field, its refusal to connect confined independent companies within the limits of the particular territories they served.” \textit{Id.} at 350.
\item \textsuperscript{114} MUELLER, \textit{supra} note 14, at 44.
\item \textsuperscript{115} \textit{Id.} at 44-45; \textit{see} SIDAK \& SPULBER, \textit{Deregulatory Takings and the Regulatory Contract, supra} note 13, at 13; Sidak \& Spulber, \textit{Givings, Takings, supra} note 13, at 1085.
\item \textsuperscript{116} MUELLER, \textit{supra} note 14, at 107-11.
\item \textsuperscript{117} \textit{Id.} at 129.
\item \textsuperscript{118} \textit{Id.} at 129-30.
\item \textsuperscript{119} \textit{Id.}
\item \textsuperscript{120} 282 U.S. 133 (1930).
\item \textsuperscript{121} MCI Telecomms. Corp. \textit{v.} FCC, 561 F.2d 365, 380 (D.C. Cir. 1977).
\end{itemize}
assumptions that have motivated a hundred years of regulation.

2. **The Common Law of Interconnection**

In general, cases have taken three approaches to the problem of telephone interconnection. First and most commonly, they simply stated there was no right to interconnection.\(^{122}\) Interconnection, if mandated, therefore, required intercarrier payments—this is the assumption that motivates most regulatory mandatory interconnection today. Second, there is a small line of cases dealing with exclusive contracts between long-distance companies and local exchanges and ruling that such contracts are illegal—all long-distance companies must be able to interconnect with local exchanges.\(^{123}\) These cases establish a right to physical interconnection, at least with regard to long-distance companies.\(^{124}\) Finally—and most foreign to modern expectations—some courts state (what was apparently a common rule of the time) that although there was no right to physical interconnection, telephones qua common carriers had to transmit messages.\(^{125}\) Thus, if a Bell customer called an independent, the Bell central office would call, on a separate line, the independent office, which would then ring its customer and tell him or her to go to a public Bell telephone and call the Bell central office.

\(\text{a. No Physical Interconnection Right}\)

The majority of cases simply state interconnection is not a right. Regulators may mandate it, however, as a legitimate exercise of their powers.\(^{126}\) The analysis is largely formalistic, looking to common carrier

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122. *See infra* notes 126-138 and accompanying text.
123. *See infra* notes 139-146 and accompanying text.
124. *Id.*
125. *See infra* notes 147-149 and accompanying text.
126. Okla.-Ark. Tel. Co. v. S.W. Bell Tel. Co., 45 F.2d 995, 997 (8th Cir. 1930) ("[A]t common law, a telephone company owes no duty to make physical connections with other telephone companies."); Memphis Tel. Co. v. Cumberland Tel. & Tel. Co., 231 F. 835, 840-42 (6th Cir. 1916); Pac. Tel. & Tel. Co. v. Wright-Dickinson Hotel Co., 214 F. 666, 669-70 (D.C. Or. 1914) (stating that interconnection is not a taking but a reasonable exercise of police powers, like physical connection required between railroads, a charge is reasonable compensation); N.W. Bell Tel. v. Cascade Tel. Co., 234 N.W.2d 130, 133 (Iowa 1975) (rejecting taking claim on the ground that "the state [has] the power to compel telephone companies physically to connect their lines... provision however, being made for compensation by the use by the patrons of one company of the line of the other company . . . .") (quoting Annotation, *Right and Duty of Telephone Companies to Make Physical Connections of Exchanges or Lines*, 11 A.L.R. 1204, 1212 (1921)); Clay County Coop. Tel. Ass'n v. S.W. Bell Tel. Co., 190 P. 747, 749-52, 754 (Kan. 1920) (surveying *Home Telephone Co. v. Sarcoxie Light & Telephone Co.*, 139 S.W. 108 (Mo. 1911), *State ex rel. Goodwine v. Cadwallader*, 87 N.E. 644 (Ind. 1909), *Pac. Tel. & Tel. Co. v. Anderson*, *
law and ruling that because mandatory interconnection is not required for railroads, absent a regulatory mandate, the same rule should be applied to telephones.\footnote{127} As a result, if interconnection is mandated, there must be

196 F. 699, 705 (E.D. Wash. 1912), and United States Tel. Co. v. Cent. Union Tel. Co., 171 F. 130 (N.D. Ohio 1909) (finding no right of interconnection); Rural Home Tel. Co. v. Ky. & Ind. Tel. Co., 107 S.W. 787, 793 (Ky. 1908) (finding no contract and no right to interconnection); Gilman v. Somerset Farmers’ Coop. Tel. Co., 151 A. 440, 443 (Me. 1930) (“Requirement, fair and reasonable, that one public telephone utility connect its lines with those of another, would not amount, in a constitutional sense, to a taking of property.”); State ex rel. Buffum Tel. Co. v. Pub. Serv. Comm’n, 199 S.W. 962, 965 (Mo. 1917); Sarcoxie Light & Tel. Co., 139 S.W. at 113 (“In other words, one telephone company, without the consent of the other, cannot take charge of and use the instrumentalities of such other company by compelling physical connection therewith.”); Blackledge v. Farmers’ Indep. Tel. Co. of Red Cloud, 181 N.W. 709, 711 (Neb. 1921) (“[I]t is now quite universally recognized that the state . . . can, in the exercise of its police power . . . compel such physical connections . . . provided that an arrangement is made so that the company required to render the service will receive proper compensation . . .”); State ex rel. Utilities Comm’n v. Carolina Tel. & Tel. Co., 148 S.E.2d 100, 113 (N.C. 1966) (A public utility cannot “be compelled to give its property to the uses and benefits of a rival, except by some form of condemnation.”) (quoting Evansville & H. Traction Co. v. Henderson Bridge Co., 134 F. 973, 978 (W.D. Ky. 1904)); Pioneer Tel. & Tel. Co. v. State, 134 P. 398, 399-400 (Okla. 1913); City of Milbank v. Dakota Central Tel. Co., 159 N.W. 99, 100 (S.D. 1916) (“[T]he connecting of telephone exchanges . . . is not an exercise of the power of eminent domain, but . . . is a mere regulation of a public service corporation, if not under an implied power resulting from the nature of the franchise enjoyed by the corporation, then under the police powers of the state.”); Home Tel. Co. v. People’s Tel. & Tel. Co., 141 S.W. 845, 848 (Tenn. 1911) (“Each telephone company under the common law is independent of all other telephone companies, save for the duty to receive and forward to any point on its line messages received from such other company or companies, and . . . is not bound to accord to any . . . outside organization or its patrons connection with its switchboard on an equality with its own patrons . . .”); State v. Skagit River Tel. & Tel. Co., 147 P. 885, 892 (Wash. 1915) (Interconnection only “can be required as a state regulation within the police power to accord the same facilities, conveniences, and uses to another or other telephone companies upon equal terms.”).

127. Memphis Tel. Co., 231 F. at 840 (“[T]he making and maintenance of a connection between two telephone companies in the absence of a contract between them depends on statute.”) (citing Home Tel. Co., 141 S.W. at 845)); Woodlands Telecomms. Corp. v. AT&T, 447 F. Supp. 1261, 1266 (S.D. Tex. 1978) (“At common law, there was no duty to interconnect facilities between carriers.”); Pac. Tel. & Tel. Co., 196 F. at 705 (“[I]t has never been held or intimated that . . . a company loses all control over its property or obligates itself to grant similar privileges to every other company that may apply therefore.”); Cadwallader, 87 N.E. at 650 (“[I]n the absence of statutory regulation of the subject, the analogies furnished by the railroad cases, and their reasoning with respect to connecting carriers, fix the true legal relations . . . [which do not require] in the absence of statute or contract, to furnish the patrons of each with unrestricted service by each submitting its or his exchange to the other.”); Sarcoxie Light & Tel. Co., 139 S.W. at 113 (“[O]ne telephone company, without the consent of the other, cannot take charge of and use the instrumentalities of such other company by compelling physical connection therewith . . . . [T]his question has been settled by this court in the railroad cases.”); United States Tel. Co. v. Middlepoint Home Tel. Co., 13 Ohio C.C. (n.s.) 337, 347 (Cir. Ct. 1910) (“[T]his rule of indiscriminate service applies only to the public. It does not apply as
some sort of compensation, or there is a taking.\textsuperscript{128}

The question is which costs should be compensated. On this point, cases’ analyses are undeveloped. Many explicitly state that there is no right to interconnection because there is no right to physical interconnection under common carriage law and leave it at that.\textsuperscript{129} They then require the regulatory commissions to determine the cost this physical invasion imposes.\textsuperscript{130} \textit{Billings Mutual Telephone Co. v. Rocky Mountain Bell Telephone Co.}, an early case, is typical:

The right to use is the thing the law has said may be acquired. Therefore, where appropriate proceedings are instituted, as in this case, it is this right of use that is to be acquired; and the reasonable, practical method by which the right may be enjoyed is use by a connection made so that the one company, by its operators, may call the operators of the other company, which must receive the long-distance business of the subscribers of the plaintiff company and care for the same very much as it would like business of its own patrons. In other words, where two companies owning different lines of telephones in Montana cannot agree upon the compensation for the privilege of

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\textit{between public service companies desiring physical connection of plants or joint use of facilities."}; \textit{Home Tel. Co.}, 141 S.W. at 849 ("We are of the opinion on the grounds above stated that the defendant companies acted within their rights when they refused to yield to the complainant company the intimate connection it demanded.").

\textsuperscript{128} \textit{Pacific Tel.} \& \textit{Tel. Co.}, 196 F. at 703 ("All the authorities agree that at common law each telephone company is independent of all other telephone companies, save for the duty to receive and forward to any point on its line messages received from such other company or companies "); \textit{Mich. State Tel. Co. v. Mich. R.R. Comm'n}, 161 N.W. 240, 245 (Mich. 1916) ("It is for complainant to show affirmatively that the physical connection ordered by the commission will inflict upon it an undue loss and one that cannot be prevented by the contemplated adjustment of rates, tolls, and charges."); \textit{Home Tel. Co.}, 141 S.W. at 848 (Mandatory interconnection "enables one company to take the property of another for public use without compensation, and deprives the latter company of its property without due process of law, in violation of the Constitution of this state and of the United States."); \textit{S.W. Tel.} \& \textit{Tel. Co. v. State}, 207 S.W. 308, 309 (Tex. 1918) ("The company is merely made to provide a facility whereby patrons of another line may, by means of that line and for a charge paid the company for the service, have access to its toll lines. It this be a 'taking' of the company's property, the property of such a company is likewise taken every time the company is made to connect its line with the store-house or residence of a local subscriber."); \textit{State v. Skagit River Tel.} \& \textit{Tel.}, 147 P. 885, 893 (Wash. 1915) ("[B]efore [the state commission's] order [for interconnection] will be valid it must provide for the payment to the Skagit Company of the cost of making the connection . . . . It must further provide for such reasonable joint rates or tolls . . . . for the use of the Skagit Company's lines.").

\textsuperscript{129} \textit{E.g.}, \textit{Billings Mut. Tel. Co. v. Rocky Mountain Bell Tel. Co.}, 155 F. 207, 211 (C.C.D. Mont. 1907).

\textsuperscript{130} \textit{Id.}
connection and use, the law of Montana obliges the one to submit to connection with the other and (upon payment of damages to be assessed), to accept a patronage [though it] . . . could not be compelled . . . were it not for the provisions of the Constitution and laws of the state.\textsuperscript{131}

Courts envisioned these payments as toll charges paid by the interconnecting carrier.\textsuperscript{132} Thus, the intercarrier payment was born. It typically required the payment of the “regular” toll charge (long-distance) \textit{and} an extra charge.\textsuperscript{133}

Notice, however, the nature of these payments is different than those of common carriers. Railroads, for example, cannot discriminate between competitors and members of the public in receiving and transporting goods.\textsuperscript{134} \textit{Billings Mutual} mandates, on the other hand, a special rate to be paid when one telephone company uses another’s line.\textsuperscript{135} This rate was not necessarily related to any general rate it charged the public.\textsuperscript{136} The common law courts, when considering the matter, are generally unanimous in this special tariff requirement.

The competitive significance of these rates became immediately apparent. The Kingsbury Commitment’s access charge regime required that AT&T lines terminated all long-distance traffic, thereby creating for AT&T

\begin{itemize}
  \item \textsuperscript{131} \textit{Id.} at 212.
  \item \textsuperscript{132} \textit{E.g., id.}
  \item \textsuperscript{133} \textit{E.g.,} Wis. Tel. Co. v. R.R. Comm’n of Wis., 156 N.W. 614, 618 (Wis. 1916). In a rare verbatim quotation of an interconnection regime between a Bell and an independent, the Supreme Court of Wisconsin quotes the interconnection order: “It is further ordered, that each subscriber of the Wisconsin Telephone Company desiring service over the toll lines of the La Crosse Telephone Company shall be charged for each message, in addition to the regular charge of the La Crosse Telephone Company . . . [f]or all distances of not over 50 miles from the office of the La Crosse Telephone Company, 5 cents; for all distances over 50 miles and not over 100 miles from such office, 10 cents; and for all distances over 100 miles from such office, 15 cents.” \textit{Id.} (quoting Winter v. Tel. Cos., 15 Wis. R.R. COMM’N REP. 36, 42). A similar approach was used in the Kingsbury Commitment: “[t]he subscribers of the Independent company having toll connections [with AT&T] . . . shall pay for such connections the regular toll charge of the Bell company and in addition thereto . . . a connection charge of ten cents . . . .” Letter from N.C. Kingsbury, Vice President, AT&T, to the United States Attorney General (Dec. 19, 1913), \textit{reprinted in} \textit{MacMeal, supra} note 5, at 206.
  \item \textsuperscript{134} \textit{E.g.,} McCoy v. Cincinnati, I., St. L., & C.R.R. Co., 13 F. 3, 7, 9-10 (C.C.S.D. Ohio 1882) (holding that a railroad could not form exclusive delivery relationship with one stock-yard at the expense of others).
  \item \textsuperscript{135} \textit{Billings Mut. Tel. Co.}, 155 F. at 212; \textit{Wis. Tel. Co.}, 156 N.W. at 621 (“Whatever appropriation there is, is by the person who is using the wire, and for this he pays the regular toll charge, and something additional besides.”).
  \item \textsuperscript{136} \textit{Id.}
\end{itemize}
a termination monopoly over all long-distance and placing the independents at a clear competitive disadvantage. As Mueller concludes, the non-reciprocal tariffs and interconnection requirements (that all toll traffic be carried by AT&T at rates much higher than previously charged) doomed the independents.

b. Long Distance Interconnection

Three cases—one federal, two from state supreme courts—ruled that local telephone companies must connect to all long-distance companies that wish to interconnect. In other words, these cases create a right for long-distance companies to interconnect with local exchanges.

The reasoning behind these opinions proceeds from common carriage law’s anti-discrimination requirement. Just as a common carrier cannot discriminate among end-users, so it cannot discriminate among long-distance companies. If a local company connects with one, it must connect with all. Some have criticized the opinion as “airy” and, indeed, these cases cannot truly reconcile their holdings with the railroad interconnection cases. It is also claimed that the independents’ efforts to build their own long-distance network were doomed because, without exclusive contracts with local phone companies, they could not compete against AT&T’s established long-line network.

While recognizing the conflict with the railroad cases, United States Telephone is probably the only case that recognizes the conflict between the common carrier right of hand-off and the technology of telephony in which physical interconnection, not merely hand-off, is required. United States Tel. Co. v. Cent. Union Tel. Co., 171 F. 130, 147 (N.D. Ohio 1909), aff’d 202 F. 66 (6th Cir. 1913); Union Trust & Sav. Bank v. Kinloch Long-Distance Tel. Co., 101 N.E. 535, 538-39 (Ill. 1913); Home Tel. Co. v. Granby & Neosho Tel. Co., 126 S.W. 773, 781 (Mo. Ct. App. 1910) (“We therefore conclude that, as by the contract involved here the defendant granted the right of a physical connection with its exchange to the plaintiff, this raised an obligation on the part of defendant to grant the same right to other telephone companies as well . . . .”) (citing State ex rel. Goodwine v. Cadwallader, 87 N.E. 644, 652 (Ind. 1909)).

137. Id. at 131-35.
138. Id.
139. United States Tel. Co. v. Cent. Union Tel. Co., 171 F. 130, 147 (N.D. Ohio 1909), aff’d 202 F. 66 (6th Cir. 1913); Union Trust & Sav. Bank v. Kinloch Long-Distance Tel. Co., 101 N.E. 535, 538-39 (Ill. 1913); Home Tel. Co. v. Granby & Neosho Tel. Co., 126 S.W. 773, 781 (Mo. Ct. App. 1910) (“We therefore conclude that, as by the contract involved here the defendant granted the right of a physical connection with its exchange to the plaintiff, this raised an obligation on the part of defendant to grant the same right to other telephone companies as well . . . .”) (citing State ex rel. Goodwine v. Cadwallader, 87 N.E. 644, 652 (Ind. 1909)).
141. United States Tel. Co., 171 F. at 147.
142. Id. at 144 (“If the local company extends the use of its lines to long-distance service, does it make the long-distance business any the less of a public character than its local service?”).
143. Bell, supra note 47, at 1770.
144. Id.
States Telephone states that

[T]he telephone subscriber must, in order to have efficient and satisfactory long-distance service, be able to talk to the individual with whom he desires to have conversation. He cannot relay his conversation as passengers can change cars, or freight can be transferred from one station or road to another. The act of speaking over a telephone is single and instantaneous, and is to be radically distinguished in its character from an act of transportation.

All of these observations are intended to illustrate the truth that the telephone business, in its practical operations, is to be distinguished from railroads, and even from telegraph companies, because the telegraphic message may be relayed and repeated before reaching its destination; while a conversation may be repeated, yet everybody knows that in common practice that is not telephoning at all, and such a method of communication between persons far distant from each other is practically unknown. One may, it is true, send a message to another to be repeated, but that is like a conversation that one tells another to repeat to a third person. That is rather telegraphing than telephoning.\(^\text{146}\)

These cases, however, are vague as to who should bear interconnection's cost. In that regard, they say little to the dominant cases' argument that there must be compensation for the use of other carriers' networks. Their indifference to these basic questions perhaps explains their limited influence.

c. Simple Common Carrier Conveyance

Where there was no interconnection between two telephone companies, it was often the practice—indeed a legal duty given telephone companies' status as common carriers—for one telephone company to call the central office of the other telephone company that would then call its subscriber and tell her to go to a public phone belonging to the first telephone company.\(^\text{147}\) A court described the process:

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\(^{146}\) Id.

\(^{147}\) Mich. State Tel. Co. v. Mich. R.R. Comm'n., 161 N.W. 240, 243 (Mich. 1916) ("Without the physical connection each subscriber to a Citizens' telephone is entitled to the same use of complainant's lines that he would have with the physical connection; the difference being that with the lines connected he can talk from his own telephone, while without the connection he would be obliged to go to a public station of complainant company."); Home Tel. Co. v. Sarcoxie Light & Tel. Co., 139 S.W. 108, 112 (Mo. 1911)
Where there was a call over the Bell toll line for a resident of La Crosse who was a subscriber to the exchange of the local company, but not to that of the plaintiff, an operator in the local company's office was notified of such call by telephone. The operator then notified its subscriber of the call, and such subscriber could respond only by going to a Bell station or to a place where a Bell phone was in use. . . . the average waiting time was half an hour.\textsuperscript{148}

These cases clearly recognized the right to hand-off; however, the mere transmission of messages was hardly feasible compared to the efficiency and convenience of physically connected switchboard. These cases illuminate the questions of allocation of cost and of takings. The calling party "paid" through her general subscription to get the message forwarded from her carrier's office to that of the recipient. Once the network received the call, the second carrier then absorbed the cost of contacting its subscriber. There was no taking because sender and receiver split the cost of interconnection. This approach perfectly mirrored traditional common carriage law.

3. Conclusion

The basic premise underlying huge portions of telecommunications law—that the common law gives carriers the right to be free from interconnection and that intercarrier payments must compensate for this right's infringement—is incorrect. The dominant strain is against interconnection, but there are distinct countercurrents. Considering the short time span over which they were written, it is perhaps not surprising that these cases failed to reconcile the common carriage right of hand-off with the common carrier's right not to physically interconnect with other carriers. As the following Section argues, this was because they failed to

\textsuperscript{148} Wis. Tel. Co. v. R.R. Comm'n of Wis., 156 N.W. 614, 616 (Wis. 1916); \textit{see also} Pac. Tel. & Tel. Co. v. Anderson, 196 F. 699, 703 (D.C. Wash. 1912) ("[A]t common law each telephone company is independent of all other telephone companies, save for the duty to receive and forward to any point on its line messages received from such other company or companies . . . .").; \textit{Mich. State Tel. Co.}, 161 N.W. at 243 ("The business of a telephone company is to transmit oral messages from one point to another, and for that purpose every patron, whether he is a subscriber or not, has the use of its lines for the time being. That is the public use to which they are dedicated. Without the physical connection each subscriber to a Citizens' telephone is entitled to the same use of the complainant's lines that he would have with the physical connection . . . .").
understand the economics of interconnection, properly define the property rights of common carriers, and carefully identify the costs incremental to interconnection.\footnote{149}{See infra Section II.}

II. TAKINGS, HAND-OFF INTERCONNECTION, AND PHYSICAL INTERCONNECTION

Modern takings law, on which the early common law cases did not rely, has created two possible types of takings potentially applicable to mandatory interconnection.\footnote{150}{See Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg’l Planning Agency, 535 U.S. 302, 303 (2002) (“[T]he test of the Fifth Amendment itself provides a basis for drawing a distinction between physical takings and regulatory takings.”).} First, government regulation is a taking\footnote{151}{See NOWAK & ROTUNDA, supra note 38, § 11.13 (a “property use regulation will constitute a taking of property for which compensation is due if the regulation unjustifiably shifts social costs to an individual property owner or a group of property owners”); see also Pa. Coal Co. v. Mahon, 260 U.S. 393, 415 (1922).} (a regulatory taking) if it (i) imposes economic damage and (ii) this damage rises above some standard.\footnote{152}{See Pa. Coal Co., 260 U.S. at 414; see also Keystone Bituminous Coal Ass’n v. DeBenedictis, 480 U.S. 470, 496 (1987).} For decades, as law students in property class know all too well, the Supreme Court has struggled over what this standard might be and has produced numerous tests for different types of economic regulation, including whether or not such damage interferes with any economically viable use of the property,\footnote{153}{Penn Central Transp. Co. v. City of New York, 438 U.S. 104, 124 (1978).} interferes with a reasonable return on its investment,\footnote{154}{Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1016, 1019 (1992).} or eliminates the entire value of the land.\footnote{155}{E.g., Susan Rose-Ackerman & Jim Rossi, Disentangling Deregulatory Takings, 86 VA. L. REV. 1435, 1450 (2000) (calling the regulatory taking decisions “ad hoc” and “incoherent”).} Most commentators agree that the Court has failed to produce a coherent doctrine of regulatory takings.\footnote{156}{Tahoe-Sierra, 535 U.S. at 303.} Second, a physical occupation is a per se taking.\footnote{157}{Id. at 322; Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 451 (1982).} If the government physically invades property, it must offer compensation (a per se taking) regardless of the quantum of economic damage.\footnote{158}{See infra Section IV.B.}

Interestingly, under modern takings law, both physical connection and hand-off interconnection are arguably takings.\footnote{159}{Id.} Both require carriers to receive traffic onto their property whether or not they wish to.\footnote{160}{Id.}
instance, the stagecoach must accept passengers from a competing stagecoach;\textsuperscript{160} the telephone company must receive a call on its property from a non-connected network.\textsuperscript{161} In addition, mandatory interconnection may be a regulatory taking because it imposes costs. Whether these costs reach the level necessary for a regulatory taking is, of course, not clear because regulatory takings law, in all its celebrated vagueness and imprecision, hardly identifies a point at which a taking occurs.

This Section argues that the distinction between hand-off and physical interconnection makes sense only if examined through basic microeconomic pricing theory, not the formalistic categories of modern takings law. Hand-off interconnection is not a taking because a court can presume that charging a carrier’s general price will recover its costs.\textsuperscript{162} On the other hand, physical interconnection, which requires increased capital investment, does change the rate structure, and a general rate may not recover those additional costs.\textsuperscript{163}

The common law courts presaged the general takings test for rates set by regulated utilities.\textsuperscript{164} This test, first set forth in \textit{Federal Power Commission v. Hope Natural Gas Co.}, states “if the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry . . . is at an end.”\textsuperscript{165} There is an “unconstitutional taking of property when a utility that has made a substantial investment in serving the public interest is denied recovery of its investment from ratepayers.”\textsuperscript{166} However, the test does not require that a utility recover all or any of its particular, specific costs.\textsuperscript{167} The test merely states that as long as the rate, in the aggregate, allows for a just and reasonable return on its capital, the rate is constitutional.\textsuperscript{168}

The common law courts arguably looked at the rate charged, the utility capital investment, and examined the effect of interconnection on both. If it could be reasonably presumed that interconnection’s cost could

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\item[160.] \textit{E.g.}, Bennett v. Dutton, 10 N.H. 481, at *5 (1839).
\item[161.] \textit{E.g.}, United States Tel. Co. v. Cent. Union Tel. Co., 171 F. 130, 147 (N.D. Ohio 1909).
\item[162.] \textit{Id.}
\item[163.] \textit{Id.}
\item[167.] \textit{Id.} at 1007.
\item[168.] \textit{Id.}
\end{enumerate}
\end{footnotesize}
be recovered through end-user charges, because interconnection did not result in a change in capital investment under a given capacity and demand, then interconnection was not a taking. If it did change capital investment (which physical connection does), then there would be no assurance that a general rate charged to end-users would adequately recover costs and there would be a taking.

The following Section first analyzes the need for mandatory interconnection; why it is necessary at all. The Article concludes that given network effects, the possibility of vertical foreclosure, and the market power of incumbent monopolists, mandatory interconnection is necessary in order to introduce competition into a previously monopolized network industry. The Section then examines mandatory interconnection under modern takings doctrine, concluding that both hand-off and physical interconnection are arguably takings. The Section contends, however, that the common law courts were correct in not finding a taking for hand-off interconnection because it simply imposes costs that a standard rate would recover under a given capital investment. On the other hand, mandatory physical interconnection does impose costs that the carrier’s established rate may not recover, and, therefore, is a possible taking.

A. Why the Need to Mandate Physical Interconnection?

To economists, this concern about government-mandated interconnection must seem misplaced. If it is beneficial for networks to interconnect, they should negotiate the terms and do so without any governmental intervention. And, indeed, interconnection is mutually beneficial. In fact, one of the earliest cases recognized in 1911 what economists now term “network effects”:

Neither would the fact that there was some expense incurred alters the situation [of mandatory interconnection], because it is the right of the state within reasonable limitations to require public service corporations to increase their facilities where the public

169. See infra Section II.A.
170. See infra Section II.B.
171. Id.
172. Id.
173. Id.
175. Liebowitz & Margolis, supra note 174, at 286-87.
interest requires the increase. Instead of damage resulting from the connection ordered, it would be more reasonable to suppose that both profit and convenience would result therefrom.\textsuperscript{\ref{fn:176}} The Supreme Court of Wisconsin correctly recognized that interconnection benefits both phone companies because both companies’ customers can call more people and receive more calls.\textsuperscript{\ref{fn:177}} Interconnection, therefore, makes each network more valuable. Why, therefore, should government need to compel mandatory interconnection?

Despite this mutual benefit, there are less benign effects with networks: vertical foreclosure and the tipping phenomenon. If there are two networks, one large, the other small, a consumer would choose the larger one \textit{ceteris paribus} simply because he or she would be able to call more people and receive more calls. Thus, a small network cannot compete with a large network unless there is interconnection so that both networks have the same sized calling universe. Without a similarly sized calling universe, the larger network will likely overpower the smaller.\textsuperscript{\ref{fn:178}} Mandatory interconnection, therefore, is necessary to allow smaller networks to survive, and probably essential when attempting to introduce competition into a formerly monopolized industry, like telephony. It is not surprising that many competitive local telephone companies (CLECs) claim that the incumbents have done everything in their power to stymie interconnection. The Supreme Court recently decided whether such allegations constituted an antitrust violation.\textsuperscript{\ref{fn:179}}

In addition, it is reasonable to expect under certain circumstances that the larger network would refuse interconnection, or, at the very least, interconnect only selectively in those instances when it had to choose between not serving an area or interconnecting with an independent that was dominant in that area.\textsuperscript{\ref{fn:180}} The history of telephony suggests this is the

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  \bibitem{176} Wis. Tel. Co. v. R.R. Comm’n of Wis., 156 N.W. 614, 621 (Wis. 1916).
  \bibitem{177} Id.
  \bibitem{179} Verizon Communications Inc. v. Law Office of Curtis V. Trinko, 124 S. Ct 872, 880 (2004). In this case, the Court ruled that a refusal to interconnect does not constitute an antitrust violation under the refusal to deal or essential facilities doctrines. It is not clear how broadly this precedent will be interpreted.
  \bibitem{180} One economic description of this strategy is vertical foreclosure, which is a form of “raising rivals’ costs.” \textit{See} Steven Salop, \textit{Practices that Credibly Facilitate Oligopoly Coordination}, in \textit{RECENT DEVELOPMENTS IN THE ANALYSIS OF MARKET STRUCTURE} (1986); Patrick Rey & Jean Tirole, \textit{A Primer on Foreclosure}, in \textit{HANDBOOK OF INDUSTRIAL ORGANIZATION III} (Mark Armstrong & Rob Porter eds.) (forthcoming).
\end{thebibliography}
case. According to Mueller, competitive telephony, for the brief period it existed, was marked by “access competition” in which carriers competed for the greatest number of subscribers. The Bell affiliated companies were generally disinclined to interconnect, but apparently did so under certain circumstances. The independent companies, however, never gained the critical mass to compete effectively.

B. Modern Takings Doctrine and Mandatory Interconnection

Under modern standards mandatory interconnection constitutes a taking, but what flavor of taking, and what is the precise nature of the property taken? First, it likely is a physical, per se taking. Interconnection generally requires a competitor to locate facilities in the incumbent’s central offices or switching facilities. The FCC regulations under the Telecommunications Act of 1996 provide compensation for physical collocation of competitor facilities on incumbent’s property using its TELRIC methodology. Commentators have claimed that “[i]f a regulation authorizes a third party to establish a permanent physical invasion, Loretto and Florida Power [together make clear] . . . that it constitutes a per se taking [without resort to any of the considerations typically involved under both the Court’s] . . . regulatory takings and confiscatory rate-making [jurisprudence].”

Contrary to such commentators, mandatory interconnection, because it imposes costs that are distinct from and in addition to the cost of

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181. MUELLER, supra note 14, at 44-46, 55-60.
182. See id.
183. Id. at 44-46.
184. Id.
185. Spulber & Yoo, supra note 13, at 999.
186. Id. at 947.
188. Spulber & Yoo, supra note 13, at 946.
189. Id. (citing Yee v. City of Escondido, 503 U.S. 519, 529 (1992); Palazzolo v. Rhode Island, 533 U.S. 606, 628 (2001)). Spulber and Yoo correctly point out that the Supreme Court has stated that physical and regulatory takings “occupy separate spheres.” Id. They also correctly point out that mandatory physical interconnection is probably a per se, physical taking. Id. However, it does not seem correct, as they appear to assume, that because mandatory interconnection constitutes a physical taking, it cannot also constitute a regulatory taking. The taking doctrines may be separate but one governmental action can implicate both.
physical occupation, at least implicates regulatory takings as well.\textsuperscript{190} Interconnection imposes the cost of handing off calls; a cost that was significant in the days of operators with switchboards but has diminished enormously with computer driven technology, and is rapidly approaching zero.\textsuperscript{191} More significant, interconnection requires carriers to fortify their networks for additional traffic, if they wish to maintain their existing quality of service.\textsuperscript{192} Thus, under modern takings law, mandatory interconnection is a physical taking and is possibly a regulatory taking.\textsuperscript{193}

Further, if one follows modern doctrine and certain commentators’ interpretations of it, then there is, at least, an argument that the common law courts were incorrect to claim that hand-off interconnection was \textit{not} a taking; indeed, all of common carriage constitutes a taking under modern doctrine. Hand-off interconnection imposes the same types of costs as physical interconnection, and it would seem that the early courts were wrong in distinguishing between the two. A carrier that must unwillingly accept traffic from another carrier has its physical premises invaded by such traffic—just as the homeowner in \textit{Loretto} had its property invaded by a cable connection. In like manner, hand-off imposes the incremental cost of each phone call, i.e., the cost that each call creates on the network. Further, hand-off interconnection would require additional fortification of networks.

The distinction between hand-off and physical interconnection (and arguably common carriage itself) can be saved from constitutional takings objections if one examines how common carriers—or more broadly all networks, from the Internet and cable systems to the postal service or even toll roads—recover their costs. Drawing at least implicitly on the most basic microeconomics, courts were indeed correct in assuming that although hand-off would not impose unrecoverable costs, physical interconnection might do so. On the other hand, physical interconnection involved new common and fixed costs, which might not be recovered through the general rate.

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\item[190.] \textit{See id.} at 947-48.
\item[192.] \textit{See infra} Section III.B for a more technical discussion of this issue.
\item[193.] \textit{See Spulber} & \textit{Yoo}, \textit{supra} note 13, at 966.
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1. **Right of Hand-off**

Basic microeconomic theory shows that mandating the right of hand-off would not inflict economic damage or, more precisely, impose costs that a carrier could be presumed to recover. Assuming that a common carrier offers a price that provides it with a profit (a price that for each unit sold recovers its incremental cost and makes a contribution to fixed and common costs given a particular expected demand (number of units sold)), mandating hand-off interconnection would not cause unrecoverable costs. Indeed, seen in this light, the only purpose of refusing interconnection arguably would be to *inflict* economic harm on competitors.

Expanding on this standard model, consider the proverbial widget factory. Assume the factory has a fixed cost of $1000 for its equipment costs, real estate mortgage, etc., i.e., $1000 in fixed cost. 194 Each widget costs an extra $1 to produce in labor, electricity, etc., i.e., $1 in incremental costs. 195 Because the widget company will not choose to produce an additional widget if it cannot recover its marginal costs, the widget company must sell widgets at a price greater than $1. 196

In addition to recovering its incremental cost, the widget price must also make some contribution to fixed costs. 197 This contribution depends on how many widgets the company expects to sell. 198 If it expects to sell only a couple of widgets, say two, their price must be high enough to recover fixed and incremental costs, i.e., $501; if it expects to sell many widgets, say 2000, then their price can be lower, i.e., $2 (2000 total revenue recovers $1000 in fixed costs and $1000 in marginal costs). 199 Of course, a businessperson often does not know how much he will sell and no doubt prices represent best guesses of likely demand.

Apply this basic pricing scheme to common carriers and to the distinction between hand-off and facilities-required interconnection. A common carrier provides a service—any unit of output from a telephone call to a ferry ride—for a price, which can be presumed to recover both her incremental and some portion of the fixed cost. If this price did not recover such costs, then the carrier would be soon out of business. *At her established price and given fixed investment, there can be no way she can lose money with increased traffic.* 200

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195. Id.
196. Id.
197. Id.
198. Id.
199. Id.
200. See id. at 20-21. This, of course, assumes a flat or decreasing marginal cost—an
A court can rightly mandate hand-off interconnection without concern that such a requirement would inflict any economic damage.\textsuperscript{201} Such mandatory interconnection simply provides more business at a price at which loss can be presumed to be impossible.\textsuperscript{202} The court does not have to inquire about the adequacy of the price because that is already set and presumably allows for the profitable running of the business.\textsuperscript{203}

2. Special Facilities Physical Interconnection

Special facilities-based interconnection, however, changes these assumptions.\textsuperscript{204} Special facilities-based interconnection requires an additional plant facility, i.e., expending capital, and increasing fixed cost for new facilities.\textsuperscript{205} Simply charging the established price may not recover costs.\textsuperscript{206} Courts quite naturally have been unwilling to make special facilities-rate interconnection a common carrier right.\textsuperscript{207} If a carrier on which interconnection were forced did not raise its rate, it would lose money, or at least, recover a below-market profit.\textsuperscript{208} Thus, mandatory physical interconnection might render a firm’s going rate confiscatory even if the rate were perfectly remunerative prior to the imposed interconnection cost.\textsuperscript{209}

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\textsuperscript{201} Id. at 19-21.
\textsuperscript{202} Id.
\textsuperscript{203} Id.
\textsuperscript{204} See supra notes 86-94 and accompanying text.
\textsuperscript{205} See id.
\textsuperscript{206} See id.
\textsuperscript{207} See id.
\textsuperscript{208} See supra notes 86-94 and accompanying text.
\textsuperscript{209} See id. The following Section argues that the takings test applicable to
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III. TWO APPROACHES FOR COMPENSATING MANDATORY PHYSICAL NETWORK INTERCONNECTION: INTERCARRIER PAYMENTS V. "BILL AND KEEP" (OR PIGOU V. COASE)

It is worthwhile to review where the argument has taken us so far. Because large networks have an inherent advantage due to their market power and their possible foreclosure strategy, efforts to introduce competition in a network industry, like telephony, dominated by a former monopolist, probably must to include a regime of mandatory interconnection.\textsuperscript{210} Courts have correctly indicated that telephone mandatory interconnection, which involves special interconnection facilities, without compensation, is a taking because, as the previous Section argues, the general rate may not recover capital investment.\textsuperscript{211} The issue is, therefore, how a carrier must be compensated for this changed capital investment.\textsuperscript{212}

One answer—which virtually every regulatory regime has adopted—is that an interconnecting carrier pays for "access."\textsuperscript{213} In other words, as discussed above, they must pay for use of the \textit{other} network.\textsuperscript{214} For instance, under long-distance interconnection, interstate access charges pay for twenty-five percent of the costs of the local loop.\textsuperscript{215} All intercarrier payment regimes require the interconnector to pay for network use; whether the tariffs between AT&T and the independents, the long-distance access charge regime between the Baby Bells and the long-distance companies, the TELRIC methodology under the Telecommunications Act of 1996,\textsuperscript{216} or as discussed in Section IV, the efficient component pricing rule (ECPR) recently proposed as a method of compensation for mandatory interconnection.

All of these intercarrier payments misstate the cost of interconnection, compensating the wrong costs to avoid a taking.\textsuperscript{217} Traditional common carriage requires one carrier to bring traffic to another on its own dime and permits the second carrier to charge the end-user to carry the traffic to its

\textsuperscript{210} See supra Section II.A.
\textsuperscript{211} See supra Section II.B.
\textsuperscript{212} Id.
\textsuperscript{213} See infra Section III.A.1.
\textsuperscript{214} See id.
\textsuperscript{215} See id.
\textsuperscript{217} See infra Section III.A.1.
destination. Railroads would bring freight to each other's terminals, ferry boats would bring passengers to docks where they would connect to other ferries, etc. There would be no intercarrier payments. If we remember that a common carrier must serve all customers within its area and can recover its costs through its general subscribership rate (whether that be a phone line rate, a rail freight rate, or a ferry rate), then if traffic is brought to its area, it should simply charge its general rate for calls. Mandatory interconnection must only ensure, therefore, the incremental cost of establishing physical interconnection is fairly compensated.

The challenge then is to provide interconnection regimes that compensate networks only the costs of "getting a call" to another network. The failures of the Telecommunication Act of 1996's interconnection regime (or its implementation by the FCC) have led several economists to suggest theories of interconnection that purport to do so in an economically efficient manner. Patrick DeGraba (2000, 2001) and Jay Atkinson and Christopher Barnekov (2000, 2004) have examined interconnection regimes in which it is assumed that the both parties share the cost of interconnection (these proposals are generically called "bill and keep"). The costs of interconnection must be shared because its benefits are reciprocal; both networks get larger calling universes. DeGraba and Atkinson-Barnekov offer two simple "rules-of-thumb" to do so without intercarrier payments (these proposals are generically called "bill and keep").

Both the DeGraba and the Atkinson-Barnekov proposals split the cost of interconnection on the assumption that the benefits of calls are reciprocal; both calling and called parties pay for the call.

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218. See supra text accompanying notes 164-168.
219. See supra Section I.A.
220. Id.
221. See supra Section I.A-B.
222. Id.
223. See generally ATKINSON & BARNEKOV, supra note 11, at 9-15; see DeGraba, Central Office Bill, supra note 11, at 45-46.
224. ATKINSON & BARNEKOV, supra note 11, at 1-2; see DeGraba, Central Office Bill, supra note 11, at 59-60.
226. ATKINSON & BARNEKOV, supra note 11, at 1; Atkinson & Barnekov, supra note 174, at 1.
228. Id. at 7.
229. Id. at 28; ATKINSON & BARNEKOV, supra note 11, at 15-16.
230. DeGraba, Bill and Keep, supra note 225, at 2; see ATKINSON & BARNEKOV,
payments, from their inception under the Kingsbury Agreement to the
Telecommunications Act of 1996, have assumed, to the contrary, that the
benefits accrue solely to the calling party who should bear all the cost.231
The DeGraba and Atkinson-Barneckov proposals have been criticized by
those who argue that benefit is predominantly unidirectional.232 Many
allege that the calling party benefits exclusively, or largely, from the call
and, therefore, should pay the lion’s share of its cost.233

Although there is a healthy academic debate among economists about
the distribution of benefits from a call and who should pay for these
benefits, this Article points out that historically both sending and receiving
parties have paid for communications. For instance, until the mid­
nineteenth century, it was standard for the receiver to pay for mail.234 Until
1863 in large towns and 1912 in rural areas, Americans paid for receiving
mail delivery.235 “Sender-pays” only began to be widespread subsequent
to the invention of the penny post—an innovation for which the English
“penny post” reformer Rowland Hill can take credit.236 Hill advocated the
sender-pay rule largely as a matter of administrative convenience so that
mail carriers would not have to carry large amounts of cash and could more
easily collect payment.237 Hill realized that most costs of a postage system
are joint and common and it was of little moment whether the receiver or
sender paid.238

The exchange of international mail also demonstrates the splitting of
the cost of communication. From 1874 to 1969, international mail was
exchanged on a “bill and keep” basis under which one network (the
sender’s national postal service) would collect the fee from the sender
(through the cost of an international stamp).239 The sender’s national

supra note 11, at 1.

231. See MACMEAL, supra note 5, at 204-07; Telecommunications Act of 1996, 47

232. E.g., BERNARD HERMALIN & MICHAEL KATZ, NETWORK INTERCONNECTION WITH
TWO-SIDED USER BENEFITS 2-3 (2001), http://faculty.haas.berkeley.edu/hermalin/
Interconnection_v14.pdf.

233. Id.

234. James I. Campbell, Jr., An Introduction to the History of Universal Postal Service,
Presentation at The Future of Universal Postal Service in the United States, The Brookings

235. Id. at 3-4.

236. Id.; see also Images of the World, Rowland Hill (1795-1879): Post Office Reform:
Its Importance and Practicability, at http://imagesoftheworld.org/stamps/rowlandhill.htm
(last visited Feb. 17, 2004).


238. Campbell, supra note 234, at 4.

239. See Universal Postal Union, Frequently Asked Questions, at
postal service would then take the mail to its office in the recipient’s country.240 The recipient’s country’s mail service would then deliver for free.241 Similarly, telegrams’ recipients tipped the delivery boy and nowadays cell phone users pay for both receiving and sending of messages (at least in the United States). It is also the way e-mail is exchanged on the Internet. Both the e-mail sender and recipient pay for access to an account; sending and delivery costs are shared in some manner by each user’s ISP, and e-mailers pay whether they send or receive.

The choice between intercarrier payments and these new interconnection approaches mirrors the great debate on social cost between A.C. Pigou and Ronald Coase.242 The traditional, social welfarist approach—espoused by A.C. Pigou in the early part of the last century, thus “Pigovian,”—would be to tax one party for the cost “imposed” on the other party.243 Thus, the polluter would pay the landowner. Intercarrier payments are Pigovian: the regulator attempts to calculate the cost imposed by interconnection (the Pigovian “externality”) and to assign them to one party, in the case of long-distance access charges, the long-distance

http://www.upu.int/faq/en/index.html (last visited Feb. 17, 2004). The modern international postal system dates from the creation of the Universal Postal Union pursuant to the Treaty of Bern of 1874. Id.

240. Id.

241. James I. Campbell, Jr., Evolution of Terminal Dues and Remail Provisions in European and International Postal Law, in THE LIBERALISATION OF POSTAL SERVICES IN THE EUROPEAN UNION 30 (Damien Geradin ed., 2002). For a century, international mail was exchanged between countries without access charges. Id. The justification for this arrangement was that “every letter elicits a reply” and, therefore, cost and benefit would balance eventually, even though the delivery country received no compensation for its services. Id.

In the late 1960s, Third World countries noticed that there was a mail imbalance in that they received more mail from the developed world than they sent and, therefore, demanded termination payments arguing that their mail system was unfairly burdened. Id. Throughout the 1970s and 1980s, many Third World countries demanded more and more in termination payments, leveraging their control or monopoly of access to mail recipients, often using these fees as a revenue source. Id. Eventually, this practice elicited an international reaction and effort to curb these fees, or at least ensure that the fees went to improving mail delivery. Id. The history of international “termination” payments has remarkable similarities to the long-distance access charge dispute discussed below in which small, rural telephone companies demanded higher access charges from long-distance companies, leveraging access to their customers. See infra Section III.A.1.

Of course, the reader should see the premise behind the Third World countries’ position is flawed. Their citizens certainly benefited from receiving international mail. These countries could have more efficiently recovered international mail delivery costs from the recipients or simply from the domestic postage rate, and given the “increased value” of their postal network, it would have been reasonable to expect them to do so.


243. A.C. PIGOU, WEALTH AND WELFARE 369-75 (1912).
company; in the case of the Telecommunication Act of 1996’s reciprocal compensation, the originating carrier.244

On the other hand, Ronald Coase’s famous critique of Pigou would suggest an entirely different approach.245 Coase would likely view mandatory interconnection as an externality of production—a cost of production—like the air pollution from a factory that invades an adjacent private party’s home.246 As Coase observed, given the regulator’s limited information, there is a good probability that damages would be calculated incorrectly, creating an inefficient result.247 More important, however, Coase pointed out that it was arbitrary to choose the polluter automatically to bear the cost of its pollution.248 Consider the example of a factory that had manufactured its goods for years without complaint, until a kennel for highly sensitive, neurasthenic Pomeranian dogs moved next door, and the dogs got sick from the emissions. As Coase pointed out, externalities are a joint product of “polluter” and “aggrieved party”: both the manufacturer and the hypochondriacal Pomeranians are “responsible” for the externality.249

Applying this insight to interconnection, it seems absurd to assign the cost to one network.250 Both networks benefit from interconnection; both are “responsible” for the creation of the cost or externality of interconnection.251 Therefore, the assumption of intercarrier payments that one party should “pay” for one call’s interconnection cost is not tenable. Rather, the cost must be shared in some fashion.

In a Coasian world, parties would be able to negotiate over who should bear the externality.252 The manufacturer would find out what it would cost to limit his emissions compared to the value of his production, and the owner of the Pomeranian dog pound would calculate the cost of treating his sick dogs or relocating compared to the cost of ailing dogs.253 The two would then figure out what the externality was worth to each of them and bargain over the most efficient way to bear the costs.254

The problems for telephony—or any network industry dominated by

246. Id. at 1.
247. Id. at 3.
248. Id. at 16-18.
249. Id. at 4.
250. See id.
251. See id.
252. Id. at 3-5; Atkinson & Barnekov, supra note 174.
253. See id.
254. Id.
one firm—is that a dominant firm may have an incentive not to interconnect.\footnote{255} As discussed above, a firm with a dominant position in a network industry might have an incentive to engage in vertical foreclosure and/or raising their rivals’ costs.\footnote{256} Why? Because the large firm has an inherent size-related advantage, which interconnection would destroy.\footnote{257} Without interconnection, most people would choose the network with the largest calling universe, but with interconnection, all networks would have the same sized calling universe.\footnote{258}

What Coasian deals would firms likely reach if the dominant firm could not exercise its market power? The DeGraba and the Atkinson-Barneckov interconnection proposals try to answer that question, thus this Article terms them quasi-Coasian.\footnote{259} They set forth simple rules to apportion the cost of interconnection in light of its benefits and do so without intercarrier payments.\footnote{260} The cost of interconnection is not calculated; rather, the default rules attempt to simulate parties’ negotiation absent market power.\footnote{261}

The following Section argues that such proposals not only avoid the pitfalls and failures of intercarrier payments, but, under a proper understanding of network’s property rights, do not constitute a taking.\footnote{262} They provide compensation—in the form of network benefit—for the interconnection costs they impose.\footnote{263} The Section first describes three examples of the failure of Pigovian intercarrier payments, illustrating the intractable economic and political problems they present.\footnote{264} It then describes both the DeGraba and Atkinson-Barneckov proposals, showing that they are not takings.\footnote{265}

A. Pigovian Interconnection: Long Distance Access Charges, Reciprocal Compensation, and Long Distance Termination Charges

Intercarrier payments suffer from fundamental problems. As
DeGraba has pointed out, intercarrier payments can be gamed through regulatory arbitrage, i.e., a service can change its regulatory label and avoid intercarrier payments.\textsuperscript{266} This occurred with private lines over which businesses would transfer calls from office to office, across state lines, and thereby avoid intercarrier payments and is occurring now with IP telephony that makes long distance and international calls without paying access charges or settlement charges, respectively.\textsuperscript{267} Second, intercarrier payments confer a termination monopoly on local exchanges.\textsuperscript{268} Because the local exchange has exclusive control over access to its customers, they can “hold them hostage,” leveraging their control by charging high termination charges to those long-distance companies that wish to hand-off traffic.\textsuperscript{269} Third, under intercarrier payments, per minute rates recover flat costs, creating intractable problems of cost allocation.\textsuperscript{270} Finally, they require one party to pay for the communication when both clearly benefit.\textsuperscript{271}

In short, intercarrier payments demonstrate many of the problems of Pigovian use taxes that Coase adumbrated: they arbitrarily choose one party to bear the cost of the externality of interconnection. Regulators lack the information to properly calculate the cost of an externality.\textsuperscript{272} Indeed, intercarrier payments—with their recovery of costs that vary little, if at all, with traffic volume, through a per minute, variable cost structure—create an inherently flawed regime that no amount of information could remedy: price is higher than marginal cost leading to endemic under-usage.\textsuperscript{273} They have become, as the public choice theorists might maintain, a powerful vehicle for regulatory deal making and rent abstraction.\textsuperscript{274}

1. \textit{Long Distance Access Charges and the Allocation of Joint and Common Costs}

AT&T used its long-distance revenue to subsidize local service, through its internal, intra-corporate revenue and settlement accounting

\textsuperscript{266} DeGraba, \textit{Central Office Bill}, supra note 11, at 45.
\textsuperscript{267} \textit{Id.} at 45-46.
\textsuperscript{268} \textit{Id.} at 47.
\textsuperscript{269} \textit{See id.} at 47-48.
\textsuperscript{270} \textit{Id.}
\textsuperscript{271} \textit{Id.}
\textsuperscript{272} DeGraba, \textit{Central Office Bill}, supra note 11, at 48.
\textsuperscript{273} \textit{Id.} at 47-48.
\textsuperscript{274} Perhaps with a shrug of Gallic understatement, Jean-Jacques Laffont and Jean Tirole state that interconnection regimes “must reflect multiple objectives.” JEAN-JACQUES LAFFONT \& JEAN TIROLE, \textit{COMPETITION IN TELECOMMUNICATIONS} 98 (2000).
A sort of interconnection regime, the accounting system assigned some of the local exchange network’s costs under the long-distance interstate jurisdiction, and revenue from interstate long-distance was therefore booked to the local and intrastate networks. AT&T’s motivation for this highly complex manipulation was largely political. State utilities commissions exerted enormous political pressures on AT&T to lower local rates. This manipulation of accounting allowed AT&T to deliver lower local rates at the expense of long-distance rates. This created a tug-of-war from the 1930s to the 1960s, between federal and state regulators over the extent of local and intrastate subsidization. By the 1970s, this subsidization was expanded so that urban rates subsidized rural rates.

In the 1970s, thanks to the MCI Telecommunications Corp. v. FCC decision of Judge Skelly Wright, this system received a shock; MCI was permitted to enter long distance competition. MCI’s Execunet service was quite simple, allowing businesses to cheaply call offices in different states and avoid expensive long-distance access charges. Essentially, MCI had a local number in one city and another in a second, distant city. A subscriber to MCI’s service would call its local number in the first city on AT&T lines, MCI would then forward the call on its own lines to the distant city, without access charges, and use its local line to place the call on the local network. What rate MCI would pay for access to the still-monopolized local network was an issue the FCC had to decide. MCI claimed it should pay only the rates for two local lines. AT&T alleged that the access rate should reflect the various subsidies that long-distance bore on behalf of the

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276. Id. at 55.
277. See id.
278. Id.
279. Id. at 43-44.
280. Id. at 155-61.
281. See BROCK supra note 5, at 68-70. The AT&T subsidization of rural rates began in the 1970s with the “Ozark Plan” under which “separations rules divided expenses in accordance with usage measurements but applied weighting factors that assigned costs to the interstate jurisdiction at a far higher rate than would be determined through strict proportional usage.” Id. at 190.
283. Id. at 367-68.
284. Id. at 367.
285. BROCK, supra note 5, at 136-37.
286. Id. at 139.
287. Id.
local network. The parties could not agree, and the FCC could not decide the matter.

As a result of this quagmire, the exchange network facilities for interstate access or ENFIA tariffs were negotiated between AT&T, MCI, and the FCC. This negotiated settlement did not represent an effort to identify the costs incremental to interconnection but were a political negotiation. Under the tariffs, it was determined that the “new competitors would pay 35% of the AT&T [cost allocation] so long as their total revenues (as a group) were below $110 million per year; 45% when their total revenues were between $110 and $250 million; and 55% when total revenues were between $250 and $375 million.”

After the AT&T divestiture in 1984, the Commission devised the access charge regime to replace the ENFIA tariffs and govern the relationship between AT&T, MCI, and the new local monopolists, the Baby Bells. Unlike the ENFIA tariffs, which never purported to be anything more than a negotiated deal, the access charge regime attempted to recreate the subsidy flows of the original AT&T.

This system of Byzantine complexity, however, did not identify the costs incremental to interconnection. Rather, it simply refined the pre-existing assumptions about subsidy and access that had existed under the AT&T monopoly. While the long-distance company paid for access to the local lines, the local network did not pay for access to long-distance networks, an odd result given the mutuality of network benefit. Further, the rates long-distance companies paid were as arbitrary as the ENFIA tariffs because they did not attempt to recover the cost incremental to interconnection. The twenty-five percent of the cost of the local line was simply declared to be interstate, and this cost in the 1980s was capped at $3.50 and named the Subscriber Line Charge, or SLC, a flat

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288. Id.
289. Id.
290. Id. at 140.
291. Id.
292. Id. at 140-42.
293. Id. at 173-74.
294. Id. at 140.
295. See id. at 195-96.
296. See id. at 190-91, 195-98.
297. Id. at 195-96.
298. See id. at 176.
299. See id. at 190-91, 195-98.
300. Id. at 190; see also In re MTS and WATS Market Structure, 93 FCC 2d 241 (1983).
In high cost areas, this level of the SLC has been increased over time.\textsuperscript{301} To the extent that the SLC failed to recover the twenty-five percent of line cost, there was a per minute charge on inter-exchange carriers, or long distance carriers, called the Carrier Common Line, later evolving into flat charge called the PICC.\textsuperscript{303}

This process of subsidization has quite naturally produced bizarre results; indeed, results that display all the unpleasant fruits of Pigovian taxation. The access charge system disadvantaged long-distance companies, which had to pay for interconnection while the all LECs simply received payment—a result that became unfair with the passage of the 1996 Act and emergence of head-to-head competition between the long-distance companies and the LECs.\textsuperscript{304} While payments to the LECs have been reduced over the years, access charges continue to constitute an enormous subsidy, particularly to rural telephone companies.\textsuperscript{305} Even a brief glance at the annual statement of the United States Telephone Association, the trade group of local telephone companies, shows an enormous reliance on access charges.\textsuperscript{306} Many companies report receiving more than half of their revenue from these charges.\textsuperscript{307} Finally, the averaging of access charge rates means that this subsidy is not paid specifically by those calling “high cost” customers, but by everyone.

Attempts to reform the system have failed to correct the access charge system’s central economic flaws.\textsuperscript{308} The Telecommunications Act of 1996 mandated reform of the access charge regime and did have some positive effects.\textsuperscript{309} Section 254 of the Telecommunications Act of 1996 directs the FCC to establish an “explicit” system of universal service support to replace the existing system of implicit subsidies.\textsuperscript{310} Consequently, the

\begin{footnotesize}
\textsuperscript{301} BROCK, supra note 5, at 191; see also In re MTS and WATS Market Structure, 93 FCC 2d at 278; In re Access Charge Reform, 15 F.C.C.R. 15,982, 16,010 (May 16, 1997).
\textsuperscript{302} BROCK, supra note 5, at 190; see also In re Access Charge Reform, 12 F.C.C.R. at 16,010-11.
\textsuperscript{303} Id.; In re Access Charge Reform, 15 F.C.C.R. 12,962, 12,964-65, 12,986-88 (May 31, 2000).
\textsuperscript{304} See BROCK, supra note 5, at 183.
\textsuperscript{305} See id.
\textsuperscript{306} UNITED STATES TEL. ASS’N, ANNUAL STATEMENT app. C (2001); see also National Telecommunications Cooperative Association, Bill & Keep: Is it Right for Rural America?, at http://www.ntca.org/contentdocuments/Final%20White%20Paper%2003.04.pdf (last visited Mar. 30, 2004) (“The NTCA data request . . . shows that on average, 26.6% of the rural ILEC’s total company revenues are derived from state and interstate access charges.”).
\textsuperscript{307} Id.
\textsuperscript{309} See id.
\textsuperscript{310} 47 U.S.C. § 254 (2000). Section 254 reflects Congress’ understanding that such implicit subsidies are incompatible with a competitive regime because, given a choice of
\end{footnotesize}
CCL and its successor, the PICC, were phased out for some users in favor of an explicit universal subsidy.\textsuperscript{311} (The subsidy started as a roughly seven percent "contribution" on users based on all telecommunications service.)\textsuperscript{312}

Nonetheless, the system's internal contradictions seem to have doomed it. Access charges depend upon an arbitrary assignment of the joint and common cost of interconnection on long-distance.\textsuperscript{313} As a result, regulated long distance is overpriced and alternatives like wireless and IP telephony are eroding its market share.\textsuperscript{314} This, in turn, lowers the subsidies flowing from long-distance service creating pressure for higher access charges that, in turn, will simply further erode its market share.\textsuperscript{315}


The Telecommunications Act of 1996's implementing regulations applied an interconnection pricing regime known as TELRIC, developed for unbundled network elements (UNEs) to govern interconnection between the incumbent local telephone companies (Baby Bells or ILECs) and the new competitive local telephone companies (CLECs).\textsuperscript{316} Unlike the access charge regime that never claimed to try to recreate a market-based system of interconnection but instead were based on book value with

\begin{itemize}
  \item local providers, customers would not elect to pay the above-cost prices that support traditional implicit subsidy mechanisms. See id.; H.R. REP. No. 104-204, at 80 (1995) (recognizing the need to evaluate universal service mechanisms "in the context of a local market changing from one characterized by monopoly to one of competition").
  \item Id. at 13,021. This rate has been rising. It is now 8.7\%. See Federal Communications Commission, Public Notice, Proposed Second Quarter 2004 Universal Service Contribution Factor, CC Docket No. 96-45 (Mar. 5, 2004) ("the proposed universal service contribution factor for the Second Quarter of 2004 is .087 or 8.7\%").
  \item See DeGraba, \textit{Central Office Bill}, supra note 11, at 43-44.
  \item Id. at 39-40.
  \item Id.; see Commissioner Kathleen Abernathy, Tutorial on the Universal Service Contribution Methodology Proceeding at the NARUC Summer Meeting in Portland, Oregon (July 29, 2002). Commissioner Kathleen Abernathy stated:
    \begin{quote}
    For carriers with declining interstate revenues, this means that they must recover their contribution costs from a smaller revenue base than the one used for assessment purposes. This is the primary reason why AT&T charges its residential customers more than 11\% of its monthly bills, rather than the 7.3\% contribution factor . . . . As total revenues fall, the percentage factor must increase to ensure sufficient funding for universal service.
    \end{quote}
    Abernathy, supra.
  \item See 47 U.S.C. \textsection 251(c)(2)-(3) (2000); Local Competition Order, 11 F.C.C.R. at 15,816-56.
\end{itemize}
averaged, distributed costs, TELRIC was an explicit effort to create an efficient system of interconnection. TELRIC failed to produce non-controversial pricing. Interestingly, it is hardly clear from the statute that the same pricing standard was meant to govern both UNEs and interconnection and, arguably, interconnection only recovers direct cost (not long-range incremental cost).

In any case, TELRIC attempted to simulate the price that two interconnecting carriers would pay for UNEs under competitive market conditions, with certain caveats. Microeconomics holds that in competitive markets, prices move to incremental cost, i.e., prices reflect the cost of producing the “nth” item of output, regardless of historical, sunk cost. TELRIC aimed to isolate the long-range (long enough to treat all costs as variable and avoidable) incremental cost for providing a particular calling element. On reviewing the legality of TELRIC under the Administrative Procedures Act, the Supreme Court describes the process in the following way:

Assume that it would cost $1 a year to operate a most-efficient loop element; that it would take $10 for interest payments on the capital a carrier would have to invest to build the lowest cost loop centered upon an incumbent carrier’s existing wire centers (say $100, at 10 percent per annum); and that $9 would be reasonable for depreciation on that loop (an eleven-year useful life); then the annual TELRIC for the loop element would be $20.

Despite the sophistication of this approach, TELRIC prices developed all the problems of Pigovian taxation, at least when applied to interconnection. First, it assumed somewhat arbitrarily that one party

317. See id.
319. Compare 47 U.S.C. § 252(d)(1)(A) (stating that the rate for interconnection and UNEs shall be “based on cost”) with 47 U.S.C. § 252(d)(2)(A)(ii) (cost shall be based on “a reasonable approximation of the additional costs of terminating such calls”). The statute does not define “additional cost.” However, the only other place “additional cost” is used in the Act is in Section 224(d)(1), the pole attachment section (the rate should recover “not less than the additional costs of providing pole attachments”). 47 U.S.C. § 224(d)(1). Here, the meaning is clearly direct, incremental cost, consistent with the bill and keep theory. See id.
321. See CABRAL, supra note 194, at 20.
322. Local Competition Order, 11 F.C.C.R. at 15,851.
324. PIGOU, supra note 243, at 369-75. This discussion is primarily aimed at the Telecommunications Act of 1996’s interconnection requirements not its unbundling requirements. See 47 U.S.C. § 251 (2000); compare § 251(c), with § 251(d).
benefits exclusively from interconnection, i.e., the calling party. As pointed out, this is a highly questionable assumption. Second, as with access charges, it recovered the wrong costs for interconnection from the wrong parties, aiming to recover, not the costs incremental to interconnection, but the cost of providing, on a long-term basis, interconnection services from other carriers, not end-users.

TELRIC also results in the inability by regulators to set correct interconnection prices because, like the traffic sensitive portion of access charges, TELRIC does not recover costs in a manner in which they are incurred because it requires a per minute recovery of costs that do not vary with minutes. This gave the state commissions the impossible task of assigning joint and common costs to each unit of production, i.e., each minute of phone call. It is a staple of microeconomics that it is an arbitrary exercise to apply joint and common costs to each output. To use an example, it is arbitrary to assign any particular portion of the $1000 fixed and common costs to any unit of production. Consider the diverse prices for plane tickets, also a product with high joint and common costs (the airplane, the crew, the jet fuel) and low incremental cost (the extra lunch, the glass of Coke, the smidgen of additional fuel and baggage handling). The difference between unlimited business class fares and tourist class, three-month, non-refundable fares represents, in a rough way, the flexibility producers should have in allocating portions of joint and common costs onto individual units of production.

Of course, people's first inclination is simply to average joint and common costs over each output, and, in extremely rough terms, this is how most intercarrier payment regimes originally calculated prices. To determine a per minute cost of interconnection, the incumbent Bells calculated the average length of the phone call and then assigned an average cost to each minute. Because it was assumed that calls between any given pair of carriers would be roughly equal in number, it was also assumed that any given pair of carriers would break-even as far as the costs of interconnection. The Bells, who had the most customers, probably thought they had the advantage under this system as they would terminate most of their calls, and their competitors, the CLECs, would have to pay

326. See supra notes 223-233 and accompanying text.
327. Id
328. Local Competition Order, 11 F.C.C.R. at 15,877-79.
329. CABRAL, supra note 194, at 20-21.
331. Id. at 15,903, 16,040-41.
the Bells for termination. Further, the Bells benefited from the largely wireless traffic pattern that predominated in the 1990s. The Bells lobbied Congress and later the Commission to require intercarrier compensation.

The Internet revolution dramatically revealed the limitations of this approach. Remember that the TELRIC interconnection rates were per minute. Thus, if a carrier served a customer who only received long calls (that originated on other networks) and never made any calls, such a carrier would make a mint because the additional cost of each minute of calling was next to zero, but the per minute cost was significant (especially if there were a lot of minutes). The passage of the Telecommunications Act of 1996 coincided with the mushrooming of dial-up Internet access; traffic that was of long duration and unidirectional. If, therefore, a CLEC were to serve an ISP, the interconnecting ILEC would have to pay for calls at TELRIC rates that the CLEC terminated. These calls were long, and the ISPs didn’t call people back. Several CLECs made a huge amount of money. The Bells claimed, at one time, that they were losing between $2 and $3 billion a year from such traffic, an odd claim because they were still receiving large “reciprocal compensation” from wireless traffic. To remedy this supposed injustice, the Commission attempted to change the rules, but it proved rather difficult to carve out ISP traffic from the statutory compensation regime. The District of Columbia Circuit remanded the Commission’s order and then remanded the subsequent order on remand.

332. Id. at 15,903, 16,036, 16,038-44.
335. Id.
336. Id.
337. See id.
338. See id.; see also Atkinson & Barnekov, supra note 174, at 3; see also Letter of W. Scott Randolph, Verizon Communications, to Magalie R. Salas, Secretary, FCC, C.C. Docket No. 99-68 (November 1, 2000) (stating incumbent LEC payments to competitive LECs rose from small amounts to over $2 billion annually). The fact that the incumbents were net recipients of wireline to wireless reciprocal compensation is supported by the recent Sprint petition. In this petition, Sprint received the right to charge higher rates for reciprocal compensation than wireline companies. See In re Cost-Based Terminating Compensation for CMRS Providers, 18 F.C.C.R. 18,441 (Sept. 3, 2003). Rather than charge these rates, Sprint has simply opted for bill and keep interconnection agreements. See Atkinson & Barnekov, supra note 174, at 27.
339. See Bell Atl. Tel. Cos. v. FCC, 206 F.3d 1, 3 (D.C. Cir. 2000).
340. Id. at 3; WorldCom, Inc. v. FCC, 288 F.3d 429, 434 (D.C. Cir. 2002).
3. Termination Monopoly: CLEC Termination Charges

Another problem with access charges is that they give all local carriers market power over terminating access—or, at least, the incentive to push for as high as possible rates. 341 Interconnecting originating networks, either CLECs or long distance companies, must use the called party’s carrier to place a call to such customer. 342 In other words, “each terminating carrier, no matter how small, has a monopoly over termination to its own customers.” 343 All other carriers that wish to reach these customers must first “pay” the terminating carrier for the privilege. 344 The terminating carrier will therefore use its market power to extract as much as it can from the other carriers. 345 These high prices will neither be paid by the receiving subscriber nor, due to federal averaging regulations, will they be directly paid by the calling party. 346 Rather, the cost will be spread over all the subscribers of the calling party’s network, insulating the terminating carrier from feeling the effects in market demand elasticity that charging monopolist terminating rates to end-users might induce. 347 This problem exists (to a lesser degree because of non-averaging) with termination fees in international mail, 348 international settlement charges for international calling, 349 and CLEC terminating access charges under the Telecommunications Act of 1996. 350

The emergence of this market power is a direct result of the common law takings assumption that each network is supposedly independent and has the right to compensation from the interconnecting carrier. Under simple “hand off” interconnection, the carrier could not leverage its access against other carriers, and this problem did not exist. If the terminating

341. DeGraba, Central Office Bill, supra note 11, at 47.
342. Id.
343. Id.; see also In re Access Charge Reform, 11 F.C.C.R. 21,354, 21,472 (Dec. 24, 1996) (“[T]erminating access may remain a bottleneck created whichever LEC provides [terminating] access for a particular customer [even if competitors have entered the market].”).
344. DeGraba, Central Office Bill, supra note 11, at 44.
345. See id. at 44-47.
347. Id.
349. Kiser & Collins, supra note 109, at 35-27. “Despite an aggressive effort by the FCC to bring international accounting rates closer to cost, many countries continue to subsidize domestic phone service by allowing monopoly providers to charge disproportionately high settlement rates for incoming international calls (generally paid by U.S. long-distance companies).” Id. at 35.
350. Uri, supra note 346, at 613.
carrier wanted to charge high rates, it would have to charge them to end-users, and thus would face the competitive consequences of its actions. If carriers charged high prices for termination, they would face competitive pressures directly from wireless and Internet providers. Consumers would be aware of and pay the full prices for calls and could exert pressure to lower the price or reduce their calls to these “hostages.” Intercarrier payments, on the other hand, allow carriers to shift the cost of their networks onto other subscribers, average the cost among all of the subscribers, and thereby permit carriers to avoid the full competitive impact of their excessive access pricing.

B. Quasi-Coasian Interconnection: Another Way?

The costs that intercarrier payments must recover in order to avoid a taking are the cost of physical facilities incremental to interconnection and the cost incremental to a particular phone call. The following Section shows: (i) how the first costs can be recovered through the added benefits that interconnection provides, and (ii) how the second type of cost should be recovered through end-user rates, not intercarrier compensation, thereby avoiding the pitfalls of Pigovian interconnection.

Interconnection has benefits and costs; thus in an ideal situation, e.g., one without market power and the tipping effect, there would be no need for regulation. 351 Parties would only interconnect when both benefit. 352 This is, to a large degree, how the Internet backbone works. 353

Then how, in a non-ideal world, i.e., one in which there is an incumbent monopolist with a huge amount of market power, would it be possible to recreate the deal that would have been made in the absence of that market power? 354 Such a recreation would balance the benefit of interconnection with its costs and provide an interconnection solution that the parties would likely have negotiated in the absence of market power, i.e., the Coasian solution. 355 In other words, assuming strong property rights over networks (access charges blur property rights), how would parties negotiate over network interconnection? It is arguable that such parties would split the cost of interconnection. This “recreation” uses the

352. Id.
353. Id.
354. See Atkinson & Barnekov, supra note 174, at 5.
355. See id.
split as a default rule which would be the starting point for negotiations. Notice that this solution does not involve setting a price. It simply involves splitting the burden of interconnection in proportion to its benefit. Without pricing issues, these regimes avoid many of the pitfalls discussed above for Pigovian interconnection. The regulator does not have to calculate cost or allocate fixed costs to particular outputs.

Recently, two proposals have been forwarded that do precisely that. DeGraba (2000) recommends that carriers be obligated to bring traffic, on their own dime, to the other carrier’s central office. DeGraba (2002) modifies this proposal, requiring carriers to arrive at an agreed upon meet point (interconnection point) and bear the costs of building their networks to such point. Atkinson and Barnekov (2000) simply state that as an initial default subsequent to negotiation, the incremental cost of interconnection be split. The motivating idea behind both proposals is that interconnection provides a clear benefit to both carriers. It increases both networks’ calling universe, thereby increasing the value of each network and presumably allows carriers to charge more for subscription. If the burdens of interconnection were balanced with its benefits, then no intercarrier payments would be necessary and no takings issues would emerge.

DeGraba begins with the assumption that a call benefits both parties equally and, that ideally, the call should be priced to each party at one half of its incremental cost in order to achieve maximum efficiency. Given the difficulty of figuring out the cost incremental to interconnection, regulators should simply require that each carrier would be responsible for bringing traffic to each other’s central office, or another meet point;

356. Id.
357. Id.
358. Id.
359. See id. at 5-6.
360. See id.
361. DEGRABA, BILL AND KEEP, supra note 225, at 8.
362. DeGraba, Central Office Bill, supra note 11, at 84.
363. ATKINSON & BARNEKOV, supra note 11, at ii.
364. Id. at ii; DeGraba, Central Office Bill, supra note 11, at 84.
365. ATKINSON & BARNEKOV, supra note 11, at ii; DeGraba, Central Office Bill, supra note 11, at 84.
366. ATKINSON & BARNEKOV, supra note 11, at ii; DeGraba, Central Office Bill, supra note 11, at 84.
368. DeGraba, Central Office Bill, supra note 11, at 76-78.
369. Id. at 76-77.
and afterwards the network would be responsible for carrying the traffic to its customers.\textsuperscript{370} Costs would be recovered through end-users.\textsuperscript{371}

Atkinson and Barnekov argue that the default rule that costs incremental to interconnection should be split equally between interconnectors.\textsuperscript{372} Rather than concentrate on DeGraba’s notion that the benefit is mutual and, therefore, its cost should be split, they concentrate on benefits that network effects provide.\textsuperscript{373} They show that splitting the cost incremental to interconnection has an interesting result under certain assumptions; \textit{ceteris paribus} interconnection’s cost per subscriber on both networks will become equal under this rule.\textsuperscript{374}

Their model is quite straightforward and worth examining.\textsuperscript{375} They start with two networks.\textsuperscript{376} The links do not represent wires, but, rather, the work or cost that interconnection involves.\textsuperscript{377} They term them “urlinks.”\textsuperscript{378} The “O” Network has only one urlink.\textsuperscript{379} The “X” network has four.\textsuperscript{380}

\[
\begin{array}{cc}
 O_1 & O_2 \\
 X_1 & X_2 & X_3 & X_4
\end{array}
\]

The rule for distributing urlinks is simple. O1 must talk to O2.\textsuperscript{381} Thus:

\[
\begin{array}{cc}
 O_1 & O_2 \\
 X_1 & X_2 & X_3 & X_4
\end{array}
\]
With the "X" network, maximum usage (everyone talking in the most resource-demanding way on the network) requires urlinks between X1 and X4. This requires three urlinks (the completed lines):

\[X_1 \ldots X_2 \ldots X_3 \ldots X_4\]

In addition, if X2 wishes to talk to X3, there must be another urlink (the dotted line). These connection facilities enable any possible combination of simultaneous conversations of the X network.

\[X_1 \ldots X_2 \ldots X_3 \ldots X_4\]

Now examine the urlink/size of network relationship. For the "O" network, each subscriber must bear 0.5 urlinks; for the "X" network, each subscriber must bear 1 urlinks. Thus, the "X" network is more expensive as it should be because the X network is bigger and more powerful, i.e., X offers a larger callable universe. Now, mandate interconnection between the "X" network and the "O" network. At its "worst case scenario," X1 calls O2 (shown by the straight line):

\[X_1 \ldots X_2 \ldots X_3 \ldots X_4 \ldots O_1 \ldots O_2\]

X2 calls O1 (shown by the dotted line):

\[X_1 \ldots X_2 \ldots X_3 \ldots X_4 \ldots O_1 \ldots O_2\]

X3 must speak to X4 (shown by the dash-dot line):

\[X_1 \ldots X_2 \ldots X_3 \ldots X_4 \ldots O_1 \ldots O_2\]

382. Id.
383. Id.
384. Id.
385. Id.
386. Id.
387. Id.
388. Id.
389. Id.
Interconnection, therefore, requires four extra urlinks. 391 If, following the Atkinson-Barnekov rule, one simply splits these incremental urlinks, then the X network will have six urlinks/four subscribers and the O network three urlinks/two subscribers. 392 A significant feature is that by assigning each network half of the costs incremental to interconnection, each network has the same burden per subscriber, i.e., 1.5 urlinks per subscriber. 393

Both the DeGraba and Atkinson-Barnekov proposals split in some proportion the burden of establishing interconnection and then provide an intercarrier payment of zero, i.e., eliminate intercarrier payments. 394 Each network would bear the cost of establishing interconnection in proportion to the benefit it received. 395 Small companies, which receive greater benefit, would pay more (per subscriber) than larger networks on the ground that they benefit more. 396 Thus, under Atkinson-Barnekov, carriers would split the cost of interconnection regardless of their size. 397 Smaller carriers would thereby bear the same burden as large networks, on the theory that they benefit more through interconnection than do larger networks, i.e., they gain a greater increase in callable universe. 398

It bears pointing out that the Internet interconnects in a way predicted by DeGraba and Atkinson-Barnekov. 399 The Internet backbone, which carries all Internet traffic, is a largely unregulated network consisting of numerous interconnecting networks, called backbone providers, like UUNET and Genuity. 400 End-users acquire access through phone lines (DSL or dial-up) or the cable system, which connects with Internet service providers (ISPs). 401 ISPs, in turn, connect with the Internet backbone, which consists of optic fiber cables that span the globe. 402 The networks in

390. *Id.*
391. *Id.*
392. *Id.*
393. *ATKINSON & BARNEKOV, supra* note 11, at 7-10.
394. *ATKINSON & BARNEKOV, supra* note 11, at 6; *DeGraba, Central Office Bill,* supra note 11, at 63.
395. *ATKINSON & BARNEKOV, supra* note 11, at 6; *DeGraba, Central Office Bill,* supra note 11, at 63.
396. *ATKINSON & BARNEKOV, supra* note 11, at 6; *DeGraba, Central Office Bill,* supra note 11, at 63.
398. *Id.*
399. *Id.* at 6, 27-28; *DeGraba, Central Office Bill,* supra note 11, at 39, 44-46.
400. *KENDO, supra* note 351, at 1-5.
401. *Id.*
402. *See id.* at 1-7.
the backbone interconnect under “peering” or “transit” agreements. Under peering arrangements, backbone providers interconnect for free; under transit agreements, they pay for interconnection (a flat fee).

As predicted by theory, Internet backbone providers will peer with other providers if the providers are roughly equal in size, geographic scope, and traffic volume. As Atkinson and Barnekov would suggest, equivalently sized networks bear an equivalent amount of the burden of establishing interconnection and derive equivalent benefits from such interconnection. If the networks are dissimilar, the larger network will demand a fee. This fee reflects perhaps the greater benefit that the smaller network receives from interconnection and the concomitant ability to extract this benefit. However, anything definite about transit agreements is difficult to say, largely because unlike peering arrangements, which are available on the web, their provisions are confidential.

Finally, on a slightly more speculative note, it appears that bill and keep might be adopted by all large carriers—and, in effect, end the access charge system—as a result of the “disruptive” technology of voice-over IP telephony. Only recently have companies like Vonage started to offer IP telephony long distance calls. They use the Internet to bypass the long-distance telephone networks—and thus avoid access charges. Reeling from this competitive threat, the large telephone companies are currently in negotiation about an appropriate intercarrier payment system. It seems likely that they will adopt bill and keep, with accommodation made for the rural telephone companies that, as discussed above, rely so heavily on access charges.

IV. INTERCONNECTION AND THE EFFICIENT COMPONENT PRICING RULE

J. Gregory Sidak and Daniel F. Spulber and, more recently, Christopher Yoo, have advocated the application of the efficient component-pricing rule (ECPR) for access to incumbent monopolists’

403. See id. at 4-7.
404. Id.
406. ATKINSON & BARNEKOV, supra note 11, at ii.
407. See id. at ii.
408. Id.
409. E.g., id.
410. See KENDE, supra note 351, at 4-7.
411. See TELECOMMUNICATIONS REPORT DAILY at 1 (Feb. 27, 2004).
networks. Their thesis, which they have elaborated extensively in a book and in numerous articles, asserts that incumbents should recover not only the cost of providing service when selling access to competitors or renting use of their network facilities pursuant to the Telecommunication Act of 1996’s unbundling requirements, but the opportunity cost as well. Opportunity costs are those incurred whenever one network uses a second, and that use deprives the second carrier of the opportunity to obtain other revenue. Spulber and Yoo argue, therefore, that “the correct price of those network elements depends on what the company could have obtained by selling network services.” What a regulated monopolist “could have” obtained without a competitor, however, is, as critics maintain, the “full pre-entry profits, all the way up to the full monopoly level.” (Or as Spulber and Yoo state “the opportunity cost calculation can be based on the regulated rates for the incumbent firm’s output.”)

Spulber and Yoo recently applied this idea to takings and mandatory interconnection, arguing that mandatory interconnection is (i) a physical, per se taking, and that (ii) such takings can only be compensated with the market value of the network or the ECPR price. Their proposal relies on a pricing theory that is not universally accepted. Further, this Article’s analysis would suggest that Spulber and Yoo misidentify the mandatory

412. SIDAK & SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT, supra note 13, at 13; Spulber & Yoo, supra note 13, at 904.
413. SIDAK & SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT, supra note 13, at 13.
414. Spulber & Yoo, supra note 13, at 885, 906; Spulber & Spulber, Deregulation, supra note 13, at 119; Sidak & Spulber, Givings. Takings, supra note 13, at 1079; Sidak & Spulber, Deregulatory Takings, supra note 13, at 855.
417. See Spulber & Yoo, supra note 13, at 902-03, 906-13.
418. Id. at 903.
420. Spulber & Yoo, supra note 13, at 906. This, of course, begs the question of whether regulated monopolies obtain monopolistic prices. See id. It seems at least possible, perhaps highly possible, that, given regulatory capture and information dissymmetry between regulators and the regulated, regulated rates are a bit higher than competitive rates.
421. Id. at 933-35, 980-1002.
interconnection taking issue as a physical invasion; its potential regulatory
taking is far more important. This leads them arguably to misidentify the
proper measure for compensation. Finally, to the extent Spulber and Yoo
rely on ECPR, their proposal has all the problems of intercarrier payments;
it identifies the wrong costs to compensate and recovers such costs in an
inherently inefficient manner.

A. Economic and Legal Objections to ECPR

The ECPR has received significant academic criticism, and the
Supreme Court rejected it in an Administrative Procedure Act challenge to
TELRIC. 422 The economic critique suggests that ECPR is not necessary to
achieve allocative efficiency and is likely to achieve the opposite. 423 Under
ECPR, entrants pay a price for interconnection (or any use of the network,
such as unbundled network elements as required by the Telecommunication
Act of 1996 424 that reflects the “full monopoly profits of the incumbent”
including the incumbent’s private opportunity costs. 425 ECPR, its
advocates allege, is efficient because it prevents inefficient entry; a new
entrant will not survive unless the entrant is equally efficient, or more
efficient than the incumbent. 426

One major problem with ECPR is that it confuses private with social
opportunity cost. Nicholas Economides, a leading academic in the field of
network economics, explains the difference:

Suppose that two companies, X and Y are competing for the
business of customer C, which is worth $C to each of them.
Assume that X and Y are equally cost efficient in serving C. If
customer C used to buy from X and now buys from Y, firm X’s
private opportunity cost is $C. However, the social opportunity
cost of the switch of customer C from X to Y is exactly zero,
since society does not gain or lose from customer C’s change of
carrier. Essentially, since firm X’s loss was firm Y’s gain, private
opportunity costs and gains canceled each other, and the social
cost of customer C’s change of carrier is zero. 427

423. Economides, The Tragic Inefficiency of the M-ECPR, supra note 419, at 142-45.
424. 47 U.S.C. § 251(c)(3) (2000); Local Competition Order, 11 F.C.C.R. at 15,842-43
(Aug. 8, 1996).
425. Economides, The Tragic Inefficiency of the M-ECPR, supra note 419, at 143-44.
426. Spulber & Yoo, supra note 13, at 914-16, 993.
427. Economides, The Tragic Inefficiency of the M-ECPR, supra note 419, at 142-43.
In addition to favoring one group’s opportunity costs over another’s, Jim Chen makes an
additional point that the ECPR tends to favor past generations in favor of present ones. Jim
Chen, A New Regulatory Regime for Federal-State Relations and Universal Service
The private cost to an incumbent monopolist includes the cost of the lost customer. Mandatory interconnection does inflict such a loss to the monopolist, because it expected to have a monopolized market in which to sell its goods. But, the incumbent suffers this loss, not society as a whole; therefore, there is no economic reason (from the perspective of total net social welfare) why ECPR should be mandated. Further, no economic mathematical model has yet demonstrated that non-ECPR prices will prevent inefficient entrance or other dynamic inefficiencies.\textsuperscript{428}

To the contrary, the ECPR rule is arguably inefficient and discourages efficient entry as opposed to protecting against inefficient entry, because by requiring entrants to ensure the incumbent’s monopolist profits, it “locks in” the incumbent’s inefficiencies.\textsuperscript{429} The entrant must ensure that the incumbent maintain its profits at its given level of monopolistic inefficiency.\textsuperscript{430}

Sidak and Spulber also advance a legal argument for the necessity of monopolist opportunity costs in interconnection pricing.\textsuperscript{431} They argue that a “regulatory contract” exists between the regulated utility and the state, which guarantees that the utility will make a reasonable return on its investment and that such return includes private opportunity costs.\textsuperscript{432} This argument can be attacked on two grounds. First, it is hardly clear that such contract ever existed. Further, even if it did, there is no reason to think that it would guarantee private opportunity costs.

Sidak and Spulber claim that the contract exists by implication and that it emerges like the English Constitution from the history of practice and the entire corpus of utility regulation.\textsuperscript{433} This notion has received


\textsuperscript{428} Economides also has stated: Although [ECPR] has been debated for the last 18 years, neither its creators nor its present supporters have ever provided a proof that the use of either of these two rules maximizes social surplus, and thereby deserve to be called “efficient.” ... In fact Economides and White (1995) and Laffont and Tirole (1994) have proved the general inefficiency of the ECPR rule. Economides, \textit{The Tragic Inefficiency of the M-ECPR}, supra note 419, at 142-43; see also CABRAL, supra note 194, at 82 ("although the ECPR implies productive efficiency, it has not bite with respect to price levels. In fact, prices are set at the same level as those in an unrestricted monopoly.").

\textsuperscript{429} Economides, \textit{The Tragic Inefficiency of the M-ECPR}, supra note 419, at 140-51; Economides & White, supra note 419, at 560.

\textsuperscript{430} Economides, \textit{The Tragic Inefficiency of the M-ECPR}, supra note 419, at 140-51.

\textsuperscript{431} \textit{E.g.},Sidak & Spulber, \textit{Deregulatory Takings}, supra note 13, at 855-68.

\textsuperscript{432} \textit{Id.} at 857, 864.

\textsuperscript{433} \textit{Id.} at 887-88.
critical attention.  

For instance, Herbert Hovenkamp, a leading antitrust scholar and economic historian, writes:

The existence of any such contract imposing an obligation of compensation upon governments is controversial. Some scholars make the important argument that no compensation is due because there is no regulatory contract at all—indeed, that the entire concept of a regulatory contract is a relatively recent invention, developed at the behest of the utilities themselves to justify compensation awards that a competitive firm could never expect for its own improvident investments.

As a legal matter, even if there were such a contract, it would be read narrowly against the utility:

[The Supreme Court has been clear, since the Charles River Bridge case, that] grants from the state must be explicit and narrowly construed.... it is so unmistakable that it must be regarded as a part of the rational expectations of any knowledgeable public utility investor. Literally dozens of times, throughout both the nineteenth and twentieth centuries, the Supreme Court has reiterated and consistently adhered to the Charles River Bridge prescription that contracts with the government are to be strictly construed against the grantee. In fact, the Court has often gone further, insisting that one cannot read “implications and presumptions” into the state’s promises, that regulatory promises from the state are to be given the “narrowest rational reading,” and that claimed provisions in agreements with the state be “clearly and unequivocally


435. Id.; see also id. at 816. Hovenkamp stated:
In sum, none of these decisions do not bear the weight that Sidak and Spulber attach to them. They hardly stand for the proposition that every public utility enjoys the benefit of an unwritten “regulatory contract” protecting its investment from subsequent government decisions making that investment unprofitable. Rather, they stand for a proposition that is much narrower (particularly when one considers the sophistication of public utility managers): that public utility investors get from the state precisely what they are able to bargain for, no more and no less.

Therefore, without express provision, it seems unlikely that the regulatory contract would contain a clause guaranteeing private opportunity costs.

B. Mandatory Interconnection: Physical and Regulatory Takings

The purpose of this Article is not to bury or to praise ECPR. Assume that it is legally and economically unassailable. Spulber and Yoo’s analysis still arguably misidentifies the property rights implicated. They maintain that mandatory interconnection is a physical taking.\(^{437}\) True enough. It involves, usually, the collocation of switches and other equipment in incumbents’ central offices and other facilities.\(^{438}\) At the very least, it requires that entrants’ wires touch the incumbents’ wires.\(^{439}\) Spulber and Yoo then conclude that compensation is warranted automatically pursuant to the physical invasion per se takings doctrine, not the non-possessory regulatory takings test, under which economic harm is but the first step to establish a taking, and other tests must be met as well before compensation is required.\(^{440}\)

This analysis incorrectly identifies the primary cost interconnection imposes as consisting solely of physical invasion when, in fact, as should be obvious, the lion’s share of interconnection’s cost does not involve physical invasion. Rather, mandatory interconnection involves the increased cost of handling traffic from an interconnecting carrier, which is not a physical taking.\(^{441}\) Further, the cost of physical invasion is slight, even trivial, because telephone wires simply do not take up very much room. Recall that under Loretto, on which Spulber and Yoo rely so heavily, the Court remanded for calculation of damages.\(^{442}\) On remand, it was determined that the physical invasion of the cable amounted to one dollar.\(^{443}\)

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437. Spulber & Yoo, supra note 13, at 943-44.
438. Id. at 893.
439. See Section III.B.
440. Id. at 947-49. Spulber and Yoo state that the Supreme Court has kept these two doctrines separate as far as the nature of their analysis and, indeed, they appear to have done so. Id. However, there is no precedent, nor any logical rule, that would preclude one government action from affecting both a physical invasion taking and a regulatory taking. This Section argues that mandatory interconnection may affect both, but that the physical invasion taking is quite trivial.
441. Id. at 894-95.
Thus, to the extent there is a per se physical invasion, compensation is de minimis. This is readily apparent when one considers the “value” of an entrant’s switch or wire in some incumbent’s central office if such switch or wire could not receive or transmit messages. Would it be worth anything to anybody? Communications hardware that cannot be used to communicate is not worth much and neither is the space it occupies. The plaintiff in Loretto only got one dollar for the physical trespass of a wire and that wire trespassed the exterior of a swank Upper East Side Manhattan townhouse.\(^{444}\) One can reasonably assume that floor space costs a lot less in the basement of some Bell central office in suburban Podunk.

Spulber and Yoo implicitly concede that what is really at issue is the regulatory takings (not per se possessory takings) by their choice of compensation.\(^{445}\) They first suggest looking to competitive markets, e.g., wireless, to seek proxies or benchmarks for the “price” of interconnection;\(^{446}\) which is reasonable and more will be said about that below. The market, however, that they choose is the market for interconnected services, not floor rental in a telephone company’s switching facilities.\(^{447}\) They advocate ECPR as a second choice if there does not exist sufficiently developed markets for access.\(^{448}\) This is, as discussed above, a technique for pricing network services, not the cost of floor space. In other words, ECPR measures the cost imposed on the incumbent’s network when it interconnects or provides some sort of service to an entrant. There is no reason to believe that the cost of a network service would compensate a physical invasion.

Spulber and Yoo’s first choice for compensation, competitive benchmarks, seems totally unobjectionable in theory and, if capable of implementation, perfectly correct.\(^{449}\) They point to non-regulated interconnection agreements, such as those between CMRS (“commercial mobile radio service” or, in other words, wireless phones), as a source for such benchmarks, and express the belief that “as wireless and other facilities-based competitors grow... rates charge[s]... for interconnection [between wireless competitors will continue to] emerge as a market-based reference point... [that can be used to resolve] most pricing problems.”\(^{450}\)

\(^{444}\) Loretto, 458 U.S. at 422.
\(^{445}\) Spulber & Yoo, supra note 13, at 914, 982.
\(^{446}\) Id. at 918-19, 921-22, 970-73.
\(^{447}\) Id. at 921-22, 970.
\(^{448}\) Id. at 904, 993.
\(^{449}\) Id. at 893.
\(^{450}\) Id. at 973.
Of course, it should be pointed out that such interconnection agreements do not compensate merely physical trespass but the sending and receiving of messages. This demonstrates again that mandatory interconnection involves more than a mere physical taking, and that what is of real significance is the regulatory imposition of the duty to handle traffic from interconnecting carriers.451

Further, Spulber and Yoo admit that market-based rates have not yet developed.452 Most of these contracts are proprietary and, given the relative small number of players in the industry, it is likely that access will never be commoditized in the same way that wheat or gold is, so that the “price of access” could be readily or accurately determined.453 Further, it seems likely that CMRS interconnection agreements generally have no intercarrier payments.454 Indeed, Spulber and Yoo fail to cite any examples of how CMRS providers price access, and it is difficult to see how a regulatory agency susceptible to capture could regularly and impartially review proprietary interconnection agreements.455 Finally, Spulber and Yoo fail to cite the one example of a public, unregulated interconnection agreement, peering arrangements among Internet backbones, discussed above.456 Of course, peering agreements would suggest an intercarrier payment of zero and that is not consistent with their choice of ECPR as a second-best compensation rule.457

C. ECPR: Yet Another Pigovian Intercarrier Payment

Most fundamentally, however, Spulber and Yoo misidentify the costs and benefits that interconnection imposes and confers.458 As argued above, only the costs incremental to interconnection need be recovered to avoid a taking.459 ECPR, on the other hand, measures the cost of providing

451. See id.
452. Id. at 1019.
453. Id. at 891.
455. See id. at 971-73. The FCC has trouble updating prices and costs in its TELRIC model, even when such prices are readily available as with telecommunications equipment like switches. See AT&T Corp. v. FCC, 220 F.3d 607, 617 (D.C. Cir. 2000) (affirming FCC’s determination that “AT&T has presented no evidence to persuade us that New York did not conform to TELRIC principles simply because it failed to modify one input into its cost model.”) (quoting In re Application by Bell Atl. N.Y. for Authorization Under Section 271 of the Communications Act To Provide In-Region, InterLATA Service in the State of New York, 15 F.C.C.R. 3953, 4085 (Dec. 22, 1999)).
456. See Section III.B.
457. See Spulber & Yoo, supra note 13, at 994.
458. Id. at 892.
459. See Section III.B.
network services (e.g., interconnection) and derives a per minute price for terminating calls on the incumbents' networks. But, it fails completely to recognize the benefit that incumbents receive from terminating such calls. As this Article has argued, takings law does not require the recovery of this cost from other carriers; rather, costs should be recovered from end-users. ECPR, in addition to having problems attendant to other Pigovian intercarrier payments, simply recovers the wrong costs from the wrong parties.

V. THE ONCE AND FUTURE TAKINGS TEST: HOPE NATURAL GAS

This Article has mentioned the regulated utilities takings cases only briefly. They state, as first set forth in Hope Natural Gas Co. v. Federal Power Commission, the constitutional requirements for rate setting for regulated utilities. Hope Natural Gas states that a rate cannot be so low as to prevent a reasonable return, as expected in the industry, on a prudent investment. The subject of this Article has been takings of carriers' property in deregulated environments, but the rule these cases set down is consistent with the thesis herein proposed. The quasi-Coasian interconnection regimes impose costs on networks, but these costs are in proportion to the benefits larger networks confer; the greater value of a larger calling universe. The quasi-Coasian regimes require networks to recover their costs, including the costs of interconnection from end-users. Thus, in the end, Coasian interconnection requires end-users to pay more, but they receive more in return. Following Hope Natural Gas, the test should be whether a carrier can expect to be reasonably expected to recover the imposed cost given its network's increased value. If costs are distributed in a manner consistent with the rules of

460. See Spulber & Yoo, supra note 13, at 904.
461. See id. at 906.
462. See supra notes 147-149 and accompanying text; Spulber & Yoo, supra note 13, at 912-13.
464. Id. at 809.
465. See supra notes 147-149 and accompanying text.
466. See supra Section.III.B.
467. Id.
468. Id.
469. See Chen, supra note 435, at 1558-59. Chen has convincingly argued that ECPR represents a step back to the discredited view of Smyth v. Ames, 169 U.S. 466, 546-47 (1898), that ratemaking must recover "fair value," a view that Hope Natural Gas, 196 F.2d at 809, discredited. Id. In contrast, Coasian approaches to interconnection are very much in the mainstream precedent of Hope. Compare supra Section III.B. with Hope Natural Gas
thumb discussed above, regulators can presume that carriers will obtain sufficient revenue to cover the costs of interconnection and no taking results.

Co., 196 F.2d at 806-09.