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## **Network Interconnection and Takings**

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## ABSTRACT

Seeking to encourage competitive markets or further other policies, courts and regulators have mandated interconnection between telephone networks and other communications networks. For instance, courts and regulators mandated interconnection between AT&T and the competitive long-distance companies in the 1980s and between the incumbent Bell monopolists and the competitive local exchanges under the 1996 Telecommunications Act. It is generally assumed that these mandatory interconnection regimes require intercarrier payments to avoid a taking under the Fifth Amendment. This legal belief has led in part to burdensome regulatory access charge and intercarrier payment regimes.

In light of recent economic proposals claiming that under some conditions efficient interconnection requires no intercarrier payments, this Article asks whether interconnection without payment constitutes a taking. Drawing on the history of common carriage law and examining the historical property rights of telephone and other communications industries, the Article concludes that interconnection without payment can be consistent with constitutional requirements.

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# NETWORK INTERCONNECTION AND TAKINGS

*Adam Candeb*

## INTRODUCTION

“Only connect . . .”

— E.M. Forster, *Howard’s 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 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 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 bairns, 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 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 interconnection was not feasible.

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. They reasoned because telephone interconnection required special facilities, such facilities’ costs could not simply be imposed without involving a taking of private property. If regulators then mandated interconnection, this cost must be recovered through intercarrier payments. This approach creates a *de facto* right—if no intercarrier payments are offered—to refuse interconnection, something totally new to common carriage.

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. 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. 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. This preserved the right of hand-off and presented no takings issues but was hardly practical.

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. 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. Similarly, 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-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.

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. 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 *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. 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.

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 almost self-evident. For instance, Sidak and Spulber, prolific writers in

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.” 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.”

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. 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. 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. Thus, railroads and bairers had to receive traffic from other railroads and bairers if it were presented at a public station or terminal. 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.

First, this Section reviews common carrier law, as it developed in the nineteenth century for such industries as bairers, 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 applies to telephone interconnection. 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.

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. Further, intercarrier payments, which recover fixed cost on a per minute basis, are inherently inefficient. 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.

#### A. *Common Carriers and Interconnection*

The law has used the term “common carrier” since the Middle Ages. Originally an outgrowth of the guild system, common carriage included all sorts of tradesmen. 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.

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

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. 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.

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*. Hale identified certain businesses as “clothed with a public interest” and consequently subject to stringent government regulation. 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.

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. As the dissent in *Munn* derisively queried, why are grain warehouses so affected and consequently 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.

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 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 other railroad could stop at the Atchison depot and exchange traffic. Similarly, although *The 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.

Contemporary commentators recognized neither *The Express Cases* nor *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.” 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.” Wyman notes that courts adopted this duty from bailers and stagecoaches and applied it to railroads and then later to telegraphs.

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. 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.”

Indeed, federal courts have long recognized the common carrier duty 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]most 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 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.

AT&T, at first, refused interconnection. 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. 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.

AT&T’s general unwillingness to interconnect, as well as its growing domination of the telephone industry, did generate federal antitrust regulatory concern. 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. 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.

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 v. Illinois Bell Telephone Co.*, federal courts had very little to say on interconnection until 1978 and *MCI Telecommunications Corp. v. FCC*, which opened the door for MCI’s entrance into competitive long-distance. Nonetheless, the early judicial opinions of the first part of the twentieth century provide the legal 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. 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. These cases establish a right to physical interconnection, at least with regard to long-distance companies. 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. 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.

### 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. The analysis is largely formalistic, looking to common carrier law and ruling that because mandatory interconnection is not required for railroads, absent a regulatory mandate, the same rule should be applied to telephones. As a result, if interconnection is mandated, there must be some sort of compensation, or there is a taking.

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. They then require the regulatory commissions to determine the cost this physical invasion imposes. *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 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.

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

Notice, however, the nature of these payments is different from those of common carriers. Railroads, for example, cannot discriminate between competitors and members of the public in receiving and transporting goods. *Billings Mutual* mandates, on the other hand, a special rate to be paid when one telephone company uses another’s line. This rate was not necessarily related to any general rate it charged the public. 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 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 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.

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. A court described the process:

[W]here 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.

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 understand the economics of interconnection, properly define the property rights of common carriers, and carefully identify the costs incremental to interconnection.

## 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. First, government regulation is a taking (a regulatory taking) if it (i) imposes economic damage and (ii) this damage

rises above some standard. 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, interferes with a reasonable return on its investment, or eliminates the entire value of the land. Most commentators agree that the Court has failed to produce a coherent doctrine of regulatory takings. Second, a physical occupation is a per se taking. If the government physically invades property, it must offer compensation (a per se taking) regardless of the quantum of economic damage.

Interestingly, under modern takings law, both physical connection and hand-off interconnection are arguably takings. Both require carriers to receive traffic onto their property whether or not they wish to. For instance, the stagecoach must accept passengers from a competing stagecoach; the telephone company must receive a call on its property from a non-connected network. 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. 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.

The common law courts presaged the general takings test for rates set by regulated utilities. This test, first set forth in *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." 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." However, the test does not require that a utility recover all or any of its particular, specific costs. 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.

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 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 alter 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 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.

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. 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 *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. 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.

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. The history of telephony suggests this is the 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 physical occupation, at least implicates regulatory takings as well. 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. More significant, interconnection requires carriers to fortify their networks for additional traffic, if they wish to maintain their existing quality of service. Thus, under modern takings law, mandatory interconnection is a physical taking and is possibly a regulatory taking.

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 *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 *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.

## 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. Each widget costs an extra \$1 to produce in labor, electricity, etc., i.e., \$1 in incremental costs. 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.

In addition to recovering its incremental cost, the widget price must also make some contribution to fixed costs. This contribution depends on how many widgets the company expects to sell. 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). 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.*

A court can rightly mandate hand-off interconnection without concern that such a requirement would inflict any economic damage. Such mandatory interconnection simply provides more business at a price at which loss can be presumed to be impossible. 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.

## 2. Special Facilities Physical Interconnection

Special facilities-based interconnection, however, changes these assumptions. Special facilities-based interconnection requires an additional plant facility, i.e., expending capital, and increasing fixed cost for new facilities. Simply charging the established price may not recover costs. Courts quite naturally have been unwilling to make special facilities-rate interconnection a common carrier right. 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. 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.

### 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. 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. The issue is, therefore, how a carrier must be compensated for this changed capital investment.

One answer—which virtually every regulatory regime has adopted—is that an interconnecting carrier pays for “access.” In other words, as discussed above, they must pay for use of the *other* network. For instance, under long-distance interconnection, interstate access charges pay for twenty-five percent of the costs of the local loop. 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, 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. 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 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. 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. Intercarrier 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. The DeGraba and Atkinson-Barnekov proposals have been criticized by those who argue that benefit is predominantly unidirectional. Many allege that the calling party benefits exclusively, or largely, from the call and, therefore, should pay the lion's share of its cost.

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.

Until 1863 in large towns and 1912 in rural areas, Americans paid for receiving mail delivery. “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. 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. 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.

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). The sender’s national postal service would then take the mail to its office in the recipient’s country. The recipient’s country’s mail service would then deliver for free. 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. 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. 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 company; in the case of the Telecommunication Act of 1996’s reciprocal compensation, the originating carrier.

On the other hand, Ronald Coase’s famous critique of Pigou would suggest an entirely different approach. 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. As Coase observed, given the regulator’s limited information, there is a good probability that damages would be calculated incorrectly, creating an inefficient result. More important, however, Coase pointed out that it was arbitrary to choose the polluter

automatically to bear the cost of its pollution. 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.

Applying this insight to interconnection, it seems absurd to assign the cost to one network. Both networks benefit from interconnection; both are “responsible” for the creation of the cost or externality of interconnection. 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. 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. 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.

The problems for telephony—or any network industry dominated by one firm—is that a dominant firm may have an incentive *not* to interconnect. 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. Why? Because the large firm has an inherent size-related advantage, which interconnection would destroy. 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.

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

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. They provide compensation—in the form of network benefit—for the

interconnection costs they impose. The Section first describes three examples of the failure of Pigovian intercarrier payments, illustrating the intractable economic and political problems they present. It then describes both the DeGraba and Atkinson-Barnekov proposals, showing that they are not takings.

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

Inter-carrier payments suffer from fundamental problems. As DeGraba has pointed out, inter-carrier payments can be gamed through regulatory arbitrage, i.e., a service can change its regulatory label and avoid inter-carrier payments. This occurred with private lines over which businesses would transfer calls from office to office, across state lines, and thereby avoid inter-carrier payments and is occurring now with IP telephony that makes long distance and international calls without paying access charges or settlement charges, respectively. Second, inter-carrier payments confer a termination monopoly on local exchanges. 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. Third, under inter-carrier payments, per minute rates recover flat costs, creating intractable problems of cost allocation. Finally, they require one party to pay for the communication when both clearly benefit.

In short, inter-carrier 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. Indeed, inter-carrier 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. They have become, as the public choice theorists might maintain, a powerful vehicle for regulatory deal making and rent abstraction.

1. 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 system. 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 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 rate. In high cost areas, this level of the SLC has been increased over time. 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.

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. While payments to the LECs have been reduced over the years, access charges continue to constitute an enormous subsidy, particularly to rural telephone companies. 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. Many companies report receiving more than half of their revenue from these charges. 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. The Telecommunications Act of 1996 mandated reform of the access charge regime and did have some positive effects. 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. Consequently, the CCL and its successor, the PICC, were phased out for some users in favor of an explicit universal subsidy. (The subsidy started

as a roughly seven percent “contribution” on users based on all telecommunications service.)

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. As a result, regulated long distance is overpriced and alternatives like wireless and IP telephony are eroding its market share. 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.

## 2. The Telecommunications Act of 1996, TELRIC, and the Allocation of Joint and Common Costs

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). 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 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 “n<sup>th</sup>” 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 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 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.

### 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. Interconnecting originating networks, either CLECs or long distance companies, must use the called party's carrier to place a call to such customer. In other words, "each terminating carrier, no matter how small, has a monopoly over termination to its own customers." All other carriers that wish to reach these customers must first "pay" the terminating carrier for the privilege. The terminating carrier will therefore use its market power to extract as much as it can from the other carriers. 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. 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. This problem exists (to a lesser degree because of non-averaging) with termination fees in international mail, international settlement

charges for international calling, and CLEC terminating access charges under the Telecommunications Act of 1996.

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 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. Parties would only interconnect when both benefit. This is, to a large degree, how the Internet backbone works.

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? 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. 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 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.

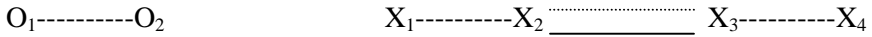
Recently, two proposals have been forwarded that do precisely that. DeGraba (2000) recommends that carriers be obligated to bring traffic, on their own dime, to the other carrier’s central office. DeGraba (2002) modifies this proposal, requiring carriers to arrive at an agreed upon meet point (interconnection 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; and afterwards the network would be responsible for carrying the traffic to its customers. Costs would be recovered through end-users.

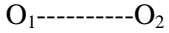
Atkinson and Barnekov argue that the default rule that costs incremental to interconnection should be split equally between interconnectors. Rather than concentrate on DeGraba’s notion that the benefit is mutual and, therefore, its cost should be split, they concentrate on benefits that network effects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

Their model is quite straightforward and worth examining. They start with two networks. The links do not represent wires, but, rather, the

work or cost that interconnection involves. They term them “urlinks.” The “O” Network has only one urlink. The “X” network has four.



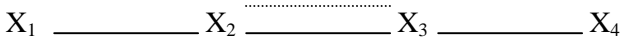
The rule for distributing urlinks is simple. O1 must talk to O2. Thus:



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):



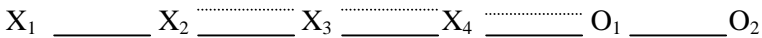
In addition, if X2 wishes to talk to X3, there must be another urlink (the dotted line). These connection facilities enable any possible combination of simultaneous conversations of the X network.



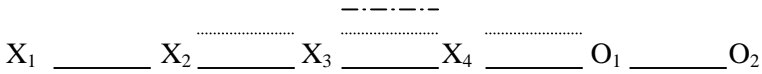
Now examine the urlink/size of network relationship. For the “O” network, each subscriber must bear 0.5 urlinks; for the “X” network, each subscriber must bear 1 urlinks. Thus, the “X” network is more expensive as it should be because the X network is bigger and more powerful, i.e., X offers a larger 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):



X2 calls O1 (shown by the dotted line):



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



Interconnection, therefore, requires four extra urlinks. 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. 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.

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. Each network would bear the cost of establishing interconnection in proportion to the benefit it received. Small companies, which receive greater benefit, would pay more (per subscriber) than larger networks on the ground that they benefit more. Thus, under Atkinson-Barnekov, carriers would split the cost of interconnection regardless of their size. 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.

It bears pointing out that the Internet interconnects in a way predicted by DeGraba and Atkinson-Barnekov. 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. End-users acquire access through phone lines (DSL or dial-up) or the cable system, which connects with Internet service providers (ISPs). ISPs, in turn, connect with the Internet backbone, which consists of optic fiber cables that span the globe. The networks in 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’ 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 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. The economic critique suggests that ECPR is not necessary to achieve allocative efficiency and is likely to achieve the opposite. 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) that reflects the "full monopoly profits of the incumbent" including the incumbent's *private* opportunity costs. 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.

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.

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.

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. The entrant must ensure that the incumbent maintain its profits at its given level of monopolistic inefficiency.

Sidak and Spulber also advance a legal argument for the necessity of monopolist opportunity costs in interconnection pricing. 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. 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. This notion has received 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 expressed.”

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. True enough. It involves, usually, the collocation of switches and other equipment in incumbents’ central offices and other facilities. At the very least, it requires that entrants’ wires touch the incumbents’ wires. 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.

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. 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. On remand, it was determined that the physical invasion of the cable amounted to one dollar.

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. 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. They first suggest looking to competitive markets, e.g., wireless, to seek proxies or benchmarks for the “price” of interconnection; 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. They advocate ECPR as a second choice if there does not exist sufficiently developed markets for access. 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. 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.” 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.

Further, Spulber and Yoo admit that market-based rates have not yet developed. 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. Further, it seems likely that CRMS interconnection agreements generally have no intercarrier payments. 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. Finally, Spulber and Yoo fail to cite the one example of a public, unregulated interconnection agreement, peering arrangements among Internet backbones, discussed above. 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.

### C. *ECPR: Yet Another Pigovian Intercarrier Payment*

Most fundamentally, however, Spulber and Yoo misidentify the costs and benefits that interconnection imposes and confers. As argued above, only the costs incremental to interconnection need be recovered to avoid a taking. ECPR, on the other hand, measures the cost of providing 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 thumb discussed above, regulators can presume that carriers will obtain sufficient revenue to cover the costs of interconnection and no taking results.

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