

Central Office Bill and Keep as a Unified Inter-Carrier Compensation Regime

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This Article proposes a single approach to interconnection pricing called Central Office Bill and Keep ("COBAK"), which applies to both local and long-distance traffic. COBAK is a default interconnection regime, which means it would apply only when two networks cannot agree on terms for interconnection. The COBAK proposal, as applied to local calls between two networks, consists of two rules. First, a called party's carrier cannot charge an interconnecting carrier to terminate a call. (Thus, each carrier recovers the cost of the loop and switch that serves the loop primarily from its own end-user customers). Second, the calling party's network is responsible for the cost of transporting a call between the calling party's central office and the called party's central office. These rules are easily extended to long-distance calls or other calls involving three or more networks. COBAK will solve or ameliorate many of the significant problems that plague the existing interconnection regimes. First, COBAK eliminates various regulatory arbitrage opportunities that beset the current interconnection regime, including the current preferential treatment of Internet Protocol ("IP") telephony compared with traditional long-distance service, and the "ISP reciprocal compensation" problem. Second, by eliminating termination charges, COBAK significantly reduces the "terminating access monopoly" problem, which gives even the smallest carrier monopoly power over calls that it terminates. Third, by eliminating inefficiently structured interconnection charges, which carriers tend to flow through to end-user prices, COBAK is likely to result in more efficient end-user prices and more efficient network usage. Finally, COBAK reduces the need for regulatory intervention, both initially and as competition develops in telecommunications markets. The Article also addresses various implementation issues raised by COBAK. Among other things, the Article discusses how central offices are identified under COBAK and focuses on how COBAK may create incentives to locate central offices inefficiently. The Article also considers certain cost recovery issues arising from the

[†] For earlier versions of this Article, see Patrick DeGraba, *Presentation at the 28th Annual Telecommunications Policy Research Conference* (Federal Communications Commission, Working Paper No. 33, Sept. 25, 2000). I wish to thank Jay Atkinson, Christopher Bamekov, Robert Cannon, Ben Childers, Dale Hatfield, Michael Kende, Johanna Mikes, Robert Pepper, Michael Riordan, William Rogerson, Gregory Rosston, William Sharkey, Howard Shelanski, Douglas Sicker, and Donald Stockdale for helpful comments. The views expressed in this Article are those of the author and do not necessarily represent the views of Charles River Associates or any of its clients.

fact that, under COBAK, carriers will recover the cost of termination from end users. The Article proposes various alternative solutions to these problems.

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Introduction

The Telecommunications Act of 1996 (“1996 Act”)¹ envisions competitive, deregulated telecommunications markets, in which services are provided by multiple complementary and competing interconnected networks. Unfortunately, the existing patchwork of interconnection regimes, which are based on historical regulatory distinctions such as local vs. long-distance, interstate vs. intrastate, and basic vs. enhanced,² was not designed for competitive and deregulated telecommunications markets, and may not facilitate the efficient development of competition in telecommunications markets. Moreover, the existing interconnection regimes may not be sustainable in increasingly competitive telecommunications markets.

For example, the explosive growth of the Internet is creating regulatory arbitrage opportunities³ that are undermining existing interconnection regimes. Specifically, Internet telephony and Internet Protocol telephony, which generally are not subject to interstate access charges, are increasingly becoming substitutes for traditional long-distance service, which is subject to these charges. Thus, the continued growth of

1 Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 86 (codified in scattered sections of 47 U.S.C.).

2 See David Sieradzki, *Will Online Calls Kill Access Charges?*, LEGAL TIMES, May 8, 2000, at 35.

3 The phrase “regulatory arbitrage” refers to profit-seeking behavior that seeks to take advantage of cost or revenue disparities that are due solely to regulation. It should be noted that this definition differs somewhat from the traditional definition of “arbitrage” as “an operation involving simultaneous purchase and sale of an asset . . . in two or more markets between which there are price differences or discrepancies.” THE MIT DICTIONARY OF MODERN ECONOMICS 17 (David W. Pearce ed., 4th ed. 1992).

these services, as their quality improves, is likely to threaten the existing regime of access charges.⁴ In addition, the rapid increase in dial-up Internet usage is creating unbalanced traffic flows between local exchange carriers⁵ (“LECs”). Due to the reciprocal compensation scheme set forth in the 1996 Act,⁶ these traffic flows result in substantial revenue transfers from incumbent LECs (“ILECs”) to competitive LECs (“CLECs”) that serve Internet Service Providers (“ISPs”). This revenue transfer, which distorts investment incentives, is generally referred to as the “ISP reciprocal compensation problem.”⁷

This Article proposes a unified approach to interconnection pricing called Central Office Bill and Keep (“COBAK”), which would apply to interconnection arrangements between all types of carriers that interconnect with the local circuit-switched network⁸—including agreements between two local exchange carriers and those between a local exchange carrier and an interexchange carrier (also referred to as “IXC” or “long-distance carrier”).⁹ COBAK also would apply to all traffic that passes over the local circuit-switched network—including local and long-distance calls, wireless to wireline calls, and dial-up connections to the Internet. As proposed, COBAK is a *default* interconnection regime, meaning it will only apply when two network operators cannot agree on the terms for interconnection.

As discussed in detail below, the COBAK proposal is premised in large part on three observations. First, both parties to a call—the calling party and the called party—generally benefit from a call, and therefore

4 See, e.g., Peter Huber, *Old Regulations Stifle the New Economy*, WALL ST. J., June 5, 2000, at A32; Mike Senkowski & Jeff Linder, *Is it a Zebra or a Striped Horse? Internet Telephony Challenges Traditional Regulatory Distinctions*, LEGAL TIMES, May 8, 2000, at 33; Sieradzki, *supra* note 2; see also Federal-State Joint Board on Universal Service, 13 F.C.C.R. 11,501 (1998) [hereinafter Stevens Report] (discussing various types of Internet telephony and whether they should be subject to access charges).

5 A local exchange carrier is a carrier such as Verizon or SBC that provides local service, as opposed to a carrier such as AT&T or Worldcom that primarily operates a large interexchange network that transports long-distance calls between local calling areas. Note that, because of the 1996 Act, local exchange carriers have begun to provide long-distance service and interexchange carriers have begun to provide local service, blurring the distinction between local and long-distance carriers.

6 See 47 U.S.C. §§ 251(b)(5), 252(d)(2) (Supp. V 1999). Of course, this problem could be eliminated by imposing access obligations on ISPs. However, drawing on its experience with the wireline network, the FCC recognized the inefficiencies involved in raising revenues on a usage basis to recover costs that are incurred on a non-traffic-sensitive basis and chose not to subject the Internet to these inefficiencies.

7 See, e.g., Sieradzki, *supra* note 2.

8 A local circuit switched network consists of the facilities operated by a LEC which are used to provide local service. These facilities consist of loops to customers' premises, switches, or the central offices that serve these loops. It also includes interoffice trunks, which carry traffic between central offices, and tandem switches, which connect multiple trunks to each other for the purposes of routing traffic.

9 An interexchange carrier provides long-distance service. The best known interexchange carriers include AT&T, Worldcom, and Sprint.

should share the cost of the call.¹⁰ Since COBAK will likely result in interconnecting networks recovering most, if not all, of their infrastructure cost from their own customers, it provides a means by which the parties to a call can share the total cost of a call. Second, competition operates more effectively when carriers recover their costs from their own end users, who can choose among competing carriers, rather than from interconnecting networks for which the terminating carrier is a de facto monopolist. COBAK takes advantage of the forces of competition where they exist by requiring a carrier to recover all of its local access costs primarily from its own end users.¹¹ Finally, COBAK recognizes that opportunities for regulatory arbitrage arise when the cost recovery methods for a specific facility differ for different “services” provided by that facility. COBAK eliminates these arbitrage opportunities by recovering the cost of certain telephone facilities (such as the local loop and the local switch) directly from subscribers, thereby avoiding the need to recover these costs from the different services provided over these facilities.

The COBAK proposal consists of two rules for local calls involving two networks. First, the called party’s network cannot charge the calling party’s network for terminating a call.¹² Second, the calling party’s network is responsible for the cost of transporting calls between the calling party’s central office and the called party’s central office.¹³ As discussed below, these rules can be easily extended to apply to calls requiring more than two networks, such as a long-distance call involving an IXC.

10 See generally Patrick DeGraba, *Efficient Interconnection for Competing Networks When Customers Share the Value of a Call* (Oct. 2001) (unpublished manuscript, on file with Yale Journal on Regulation).

11 As discussed below, *local access costs* include the cost of the loop and the cost of the local switch serving the loop. See *infra* Section I.A. COBAK does not rule out the recovery of costs using so-called “800” or “900” services.

12 Terminating a call means providing the facilities for the last segment of the call from the central office serving the called party to the called party’s premises. See *infra* note 40. In this sense, COBAK differs from most current interconnection regimes, under which the calling party’s network must pay the called party’s network for terminating the call. See generally *AT&T v. Iowa Utils. Bd.*, 525 U.S. 366 (1999); *Iowa Utils. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), *aff’d in part and remanded sub nom. AT&T v. Iowa Utils. Bd.*, 525 U.S. 1133 (1999); *Competitive Telecommunications Ass’n v. FCC*, 117 F.3d 1068 (8th Cir. 1997); *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, 11 F.C.C.R. 15,499, ¶ 1057, at 16,024-25 (1996) (Report and Order).

13 As discussed in greater detail below, the calling party’s network may accomplish this by constructing its own transport links, purchasing transport facilities or services from the called party’s network, or purchasing or leasing such facilities or services from a third network. In the early stages of moving toward a competitive market—when incumbent local carriers still possess monopoly power over local network facilities—it will most likely be necessary to require the incumbents to provide transport facilities to interconnecting networks at regulated rates. Nevertheless, even if the incumbent network provides the facilities, the cost of transporting the call will remain on the calling party’s network, which will either lease the incumbent’s facilities or purchase transport services from the incumbent. See *infra* Sections I.A-B.

This Article is organized as follows. Part I provides a brief overview of existing interconnection regimes and their associated problems. Part II explains the COBAK proposal and provides examples of how it would apply. Part III discusses the theoretical and policy justifications for the COBAK proposal. Part IV discusses how COBAK could eliminate or ameliorate the most important problems plaguing the current interconnection regimes. Finally, Part V raises certain implementation issues.

I. Overview of Existing Interconnection Regimes and Their Problems

In order to understand the COBAK proposal and its potential benefits, it is necessary to understand the existing patchwork system of interconnection arrangements and the problems associated with this system. Accordingly, this Part first provides a broad overview of existing interconnection regimes. It then describes some of the problems associated with the existing system.

A. Existing Interconnection Regimes

For much of this century, local telephony was viewed as a natural monopoly.¹⁴ Local telephone companies were given monopoly franchises and protected from competitive entry, but in return were subjected to rate regulation and certain universal service obligations.¹⁵ Because of their monopoly position, however, local telephone companies had incentives to resist interconnecting with certain other networks.¹⁶ More specifically, local telephone companies generally had no incentive to interconnect with competing local telephone companies and, when forced to interconnect, generally sought to impose high interconnection costs on other networks.¹⁷

¹⁴ See, e.g., PETER W. HUBER ET AL., FEDERAL TELECOMMUNICATIONS LAW 2 (2d ed. 1999) ("The high cost of fixed plant, the steadily declining average cost of service, and the need for all customers to interconnect with one another made it seem both sensible and inevitable to have a single, monopoly provider."); JEAN-JACQUES LAFFONT & JEAN TIROLE, COMPETITION IN TELECOMMUNICATIONS 3 (2000) ("The absence of competition was motivated by the existence of large fixed costs in several parts of the network, whose duplication was neither privately profitable nor socially desirable; the telecommunications industry was deemed to be a 'natural monopoly.'"); see also *Iowa Utils. Bd.*, 525 U.S. at 370 ("Until the 1990s, local phone service was thought to be a natural monopoly.").

¹⁵ See generally GERALD W. BROCK, TELECOMMUNICATION POLICY FOR THE INFORMATION AGE 63-70 (1994); HUBER ET AL., *supra* note 14, at 212-26 (summarizing early history of telephone regulation).

¹⁶ See, e.g., HUBER ET AL., *supra* note 14, at 213; David F. Weiman & Richard C. Levin, *Preying for Monopoly? The Case of Southern Bell Telephone Company, 1894-1912*, 102 J. POL. ECON. 103 (1994) (describing predatory strategies of AT&T, including its refusal to interconnect with independent telephone companies).

¹⁷ See *infra* Section II.A.

Therefore, regulators at both the state and federal level traditionally have intervened and regulated interconnection arrangements between local telephone companies and other interconnecting parties.

In addition, regulators at both the federal and state levels have frequently used interconnection regulation to achieve various social goals. For example, in order to keep local rates low, federal and state regulators have permitted local telephone companies to charge long-distance companies above-cost access charges for originating and terminating long-distance calls.¹⁸ Similarly, in order to encourage the development of enhanced services, the Federal Communications Commission (“the Commission”) in 1983 exempted enhanced service providers from these access charge requirements.¹⁹

What has resulted over time is a complex and frequently arbitrary patchwork of interconnection regulations that treats different classes of interconnecting parties and different types of services quite disparately even though there may be little difference in the costs that they generate.²⁰ The interconnection regime that applies in a particular situation depends on such factors as whether the interconnecting party is another local carrier, an IXC, or a subscriber; whether the service is classified as local or long-distance, interstate or intrastate, and basic or enhanced; and whether a call is completed using an enhanced service provider.

Broadly speaking, however, interconnection rules can be divided into two basic types: one set of rules that applies to “local” calls, and a second

18 See, e.g., *In re* Federal-State Joint Board on Universal Service, 12 F.C.C.R. 8776, ¶¶ 10-12, at 8784-85 (1997) (Report and Order) (discussing implicit subsidies, including those in access charges); HUBER ET AL., *supra* note 14, at 552. The reduction in revenue from these sources under COBAK would need to be recovered from some explicit mechanism such as an increase in flat charges to customers or targeted universal service and high cost support.

19 See *In re* MTS and WATS Market Structure, 97 F.C.C.2d 682, ¶¶ 75-90, at 711-12 (1983) (Memorandum Opinion and Order) [hereinafter MTS and WATS Order]. Insulating Internet services from making per minute contributions to the cost of loop facilities has contributed to ISP’s ability to offer service on a flat rated basis, which the OECD has found has “significantly increased usage and encouraged more efficient use of the network for Internet access.” DR. SAM PALTRIDGE, ORG. FOR ECON. COOPERATION AND DEV., THE DEVELOPMENT OF BROADBAND ACCESS IN OECD COUNTRIES 47 (2001) available at <http://www.oecd.org/pdf/M00020000/M00020255.pdf> (last visited Nov. 28, 2001).

20 This system of interconnection regulation is further complicated by the fact that users, carriers, and other service providers can interconnect with an ILEC’s network in a variety of ways. For example, a party can interconnect with an ILEC’s network at the line side or trunk side of a switch, and it can interconnect at an end-office switch or a tandem switch. *In re* Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, 11 F.C.C.R. 16,499, ¶¶ 209-12, at 15,608-09 (1996) (First Report and Order) [hereinafter Local Competition First Report and Order]. Similarly, a party seeking to interconnect with an ILEC can construct its own transport links to connect to the incumbent’s network, or it can purchase them from the incumbent or from third parties. See, e.g., *In re* Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, 15 F.C.C.R. 3696 (1999) (Third Report and Order and Fourth Further Notice) [hereinafter Local Competition Third Report and Order].

set of rules that applies to “long-distance” calls. Both sets of rules are, of course, subject to a number of exceptions.

For example, when a customer of one LEC makes a local call to a customer of another LEC, that local call is subject to reciprocal compensation.²¹ Under the Commission’s current reciprocal compensation rules for ILECs, the calling party’s network generally must pay the called party’s network to terminate the call.²² In addition, if the calling party’s network uses the transport facilities of the called party’s network to deliver the call to the called party’s local central office, it must also pay the called party’s network for transport. The Commission’s current rules also permit states to impose bill-and-keep arrangements if “traffic is roughly balanced.”²³

If the call is a long-distance call, the calling party’s IXC must pay either intrastate or interstate access charges, depending on whether the call crosses state lines. Under either access charge regime the IXC pays the originating LEC for local switching and transport from the calling party to the IXC’s point of presence (“POP”) in the calling party’s local area, and it pays the terminating LEC for local switching and transport between the called party and its POP in the called party’s area. In some states the intrastate access charges are set equal to the interstate charges. In other states, the intrastate access charges exceed the interstate rates.

The rules governing dial-up Internet service are such an important exception to these interconnection rules, that they almost constitute a third class of interconnection rules. Dial-up Internet service is considered an interstate service for jurisdictional purposes. This is because many data packets sent and received by dial-up users are routed across state lines over the Internet. However, the ISP pays no originating access charges.²⁴ In addition, if an ISP’s customer is served by one LEC and the ISP is served by another, then when the customer uses dial-up service, her LEC must pay the ISP’s LEC termination charges under the reciprocal compensation regime.²⁵

21 47 U.S.C. §§ 251(b)(5), 252(d)(2) (Supp. V 1999); *see also* Local Competition First Report and Order, 11 F.C.C.R., *supra* note 20, ¶¶ 1027-1118, at 16,008-58 (discussing §§ 251(b)(5) and 252(d)(2) and the requirement of reciprocal compensation).

22 Local Competition First Report and Order, *supra* note 20, ¶¶ 1057-58, at 16,024-25.

23 *Id.* ¶ 1112, at 16,055. It is interesting to note that traditionally contiguous but non-overlapping incumbent local exchange networks have frequently exchanged traffic on a bill-and-keep basis.

24 *See* MTS and WATS Order, *supra* note 19, ¶ 2, at 683. *See generally* HUBER ET AL., *supra* note 14, at 127-29. Whether terminating access charges would be owed depends on how the provider of the Internet telephony service decides to terminate the call. It appears that today many such providers find it easier simply to pay terminating access charges when delivering the call.

25 The FCC recently released an interim order which gives an ILEC the right to pay a lower rate for ISP bound traffic if it agrees to exchange all other local traffic at the lower rate. *See In re Intercarrier Compensation for ISP-Bound Traffic*, CC Docket No.99-68, F.C.C. 01-131 (Apr. 27, 2001) (Order on Remand and Report and Order).

The local and the long-distance interconnection regimes are examples of “calling-party’s-network pays” (“CPNP”) regimes. In CPNP regimes, the calling party’s network is responsible for the entire cost of a call. To the extent that a call uses the facilities of more than one network, the calling party’s network must pay those networks for the use of their facilities.²⁶ Thus, in the case of a local call, the calling party’s LEC is required to pay transport and termination for traffic that terminates on the called party’s network. Similarly, in the case of a long-distance call, the calling party’s IXC must pay interstate or intrastate terminating access charges to the called party’s LEC (as well as originating access charges to the calling party’s LEC).

An alternative arrangement that involves no inter-carrier compensation is generally referred to as a “bill-and-keep” arrangement.²⁷ Under such arrangements, the calling party’s carrier does not have to pay the called party’s carrier to terminate a call; rather, the called party’s carrier must recover the cost of termination from its end-user customer.²⁸ As previously indicated, such arrangements traditionally existed between adjacent local exchange carriers, such as between a Bell Operating Company and a neighboring rural ILEC. In addition, the 1996 Act states that the pricing rules applicable to interconnection agreements between ILECs and other LECs do not “preclude” bill-and-keep arrangements.²⁹

B. *Problems Caused by Existing Interconnection Regimes*

The current collection of interconnection regimes suffers from a number of fundamental problems. These problems distort usage of the network and deployment of facilities, impede the development of competition and the relaxation of regulation, and threaten the continued viability of the existing system.

First and foremost, the current interconnection regimes create significant opportunities to game the system through regulatory arbitrage. One such opportunity arises from the fact that IXCs must pay interstate and intrastate access charges to the LEC that originates a long-distance call, while an ISP that provides Internet or Voice over Internet Protocol

26 In the case of a local call, the calling party’s network is the calling party’s local exchange carrier. For a long-distance call, the calling party’s network is its IXC.

27 See, e.g., Local Competition First Report and Order, *supra* note 20, ¶¶ 1096-1118, at 16,045-58 (discussing bill-and-keep interconnection arrangements); *In re* Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, 11 F.C.C.R. 5020, ¶ 3, at 5024 (1996) [hereinafter LEC-CMRS Interconnection NPRM].

28 The treatment of transport costs may vary depending upon the specific bill-and-keep proposal. See *infra* Section II.D.

29 47 U.S.C. § 252(d)(2)(B) (Supp. V 1999).

(“IP”) telephony (also referred to as “VoIP”) does not.³⁰ Consequently, an end user can avoid access charges by utilizing IP telephony to place long-distance calls.³¹ Although this has not proven a serious problem to date, improvements in the quality of IP telephony could lead to significant substitution of IP telephony for traditional circuit-based long-distance service, with a consequent erosion in access revenues. A second source of regulatory arbitrage arises from the fact that the interconnection charges, which the calling party’s network has to pay to the called party’s network, generally are above cost and inefficiently structured.³² For example, various CLECs have targeted ISPs, which generally have only incoming traffic, as customers in order to become net recipients of local traffic. ILECs claim that this has cost them billions of dollars in reciprocal compensation payments.³³ Both sources of regulatory arbitrage can distort the carriers’ incentives to invest and deploy facilities efficiently and to their choices of services offered to customers.³⁴

30 The terms “Internet telephony” and “IP telephony” refer to similar but distinct concepts. IP telephony involves the provision of a telephony service or application using Internet Protocol. IP telephony may be provided over the public Internet or over a private IP network. In contrast, Internet telephony is a subset of IP telephony that is distinguished by the fact that it is provided over the public Internet and uses the domain-name system for routing. *See generally* Stevens Report, *supra* note 4, ¶¶ 83-104, at 11,541-51 (1998) (discussing Internet and IP telephony); HARRY NEWTON, NEWTON’S TELECOM DICTIONARY 364 (17th ed. 2001). For simplicity, the text will refer generally to the broader concept of IP telephony.

IP telephony can also be categorized by the equipment used to provide the service. For example, IP telephony may be provided with two personal computers (computer-to-computer IP telephony); with a computer and a standard telephone using a single IP gateway (computer-to-phone IP telephony); or with two standard telephones connecting through two IP gateways (phone-to-phone IP telephony). *See, e.g.*, Stevens Report, *supra* note 4, ¶¶ 87-89, at 11,543-44.

31 Depending on how an IP telephone call is provided, the call may be subject to access charges, reciprocal compensation, or no charges. As an example, suppose that two parties make a computer-to-computer IP telephone call. In this case, no access charges would apply, but reciprocal compensation charges might apply. In particular, if the calling party’s ISP is a customer of a different LEC than the calling party himself, then the calling party’s LEC is likely to be required to pay reciprocal compensation to the ISP’s LEC. In this case, not only does the calling party’s LEC not receive access charges, but it must also pay reciprocal compensation. If, on the other hand, the calling party and the calling party’s ISP were both customers of the same LEC, then no inter-carrier charges would apply.

32 Termination charges typically are structured as per-minute charges. Yet it is clear that most switching costs are based on required peak capacity rather than minutes of use. *See, e.g.*, *In re Access Charge Reform*, 14 F.C.C.R. 14,221, ¶¶ 211-16, at 14,328-30 (1999) (Fifth Report and Order and Further Notice of Proposed Rulemaking) [hereinafter *Pricing Flexibility Order and NPRM*] (noting that switching costs vary with peak demand and not the total number of switched minutes).

33 *See, e.g.*, *In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Intercarrier Compensation for ISP Bound Traffic*, CC Docket No. 99-68, attachment (FCC, Apr. 27, 2001) (letter from W. Scott Randolph, Verizon Communications, to Magalie R. Salas, Secretary, FCC (Nov. 1, 2000)).

34 Most dial-up Internet service still passes through the circuit switches of the traditional telephone network. It would be more efficient, however, to strip such calls off the circuit-switched network before they reach the calling party’s switch, route them over a packet-switched network, and then bypass the called party’s circuit switch when terminating the call. Doing so would eliminate the need to tie up a circuit during an Internet session, which is clearly inefficient as packets are transferred during only a small fraction of the period a customer is online. CLECs serving ISPs would most likely

A second problem is that current interconnection regimes typically give local carriers market power over terminating access. This market power arises from the fact that interconnecting originating networks, including both local and interexchange carriers, have no alternative carrier that can terminate a call to a given customer. In effect, each terminating carrier, no matter how small, has a monopoly over termination to its own customers. Under existing rules, the calling party's carrier cannot recover these termination charges directly from the customer that generates them. Therefore, there is no incentive for the called party to switch carriers in response to higher termination charges imposed by its carrier. More specifically, the called party by definition will not incur the excessive termination charges, and, because of geographic rate-averaging requirements,³⁵ the calling party will have little or no incentive to complain to the called party or ask him to switch carriers. This presents regulators with the unattractive choice of allowing non-incumbent carriers to exercise their market power,³⁶ permitting IXCs to refuse to deliver calls to terminating carriers that charge excessive rates, or regulating the terminating access rates of all carriers, including those that would not possess market power under alternative interconnection regimes.³⁷

Third, the current interconnection regime requires extensive regulatory participation. For example, traffic must be classified as either interstate or intrastate so that the appropriate cost recovery method can be used. In addition, many networks have different costs of termination. Thus, the current system of interconnection may require regulators to determine these costs and administer a regime in which each carrier collects a different termination charge.

Fourth, the existing system of inter-carrier interconnection charges is likely to result in inefficient end-user charges. To the extent that interconnection charges tend to be traffic sensitive (set on a per-minute or per-call basis), they create pressure on carriers to adopt traffic-sensitive retail prices. If the underlying network costs are not traffic sensitive,

oppose such an arrangement, however, since it would prevent them from collecting termination charges on a per-minute basis.

35 Note that, because of geographic rate-averaging requirements, IXCs cannot pass these high termination charges directly through to calling parties who place calls to these high-priced networks. Thus, end-user customers on networks with high termination charges are unlikely even to hear complaints from the parties that call them.

36 ILECs generally are not able to exercise terminating market power because their interconnection rates are regulated, and they may have less incentive to do so than CLECs because they originate a larger percentage of the calls that they also terminate.

37 See, e.g., Pricing Flexibility Order and NPRM, *supra* note 32, ¶¶ 180-90, at 14,312-20 (discussing problem of CLEC access charges); see also LAFFONT & TIROLE, *supra* note 14, at 186 (discussing the "common fallacy" that small players do not have market power and should therefore face no constraint on their termination charges). In fact, carriers with smaller market shares may have a greater incentive to charge excessive terminating access charges because those charges are unlikely to be flowed through to interconnecting carriers' end-user prices. See *id.*

however, then these traffic-sensitive retail rates will reduce usage of the network to inefficient levels.³⁸ In addition, such interconnection charges may result in customers paying higher prices for calls that cross networks than for calls that remain on one network. Such pricing would be inconsistent with the goal of providing seamless and transparent interconnection to customers.

These problems result from two fundamental flaws with a majority of the existing interconnection regimes. The first is that most regimes are CPNP regimes, which impose all of the costs of a call on the calling party. Many of these problems can be solved by adopting an interconnection regime that appropriately divides the cost of a call between the calling party and the called party. The second flaw is that the costs of a given facility are recovered in different ways from different users depending on the classification of the service provided by that facility. Unifying the cost recovery method will eliminate many of these problems. Part II proposes such a regime.

II. The COBAK Proposal

This Part presents an approach to interconnection pricing called “Central Office Bill and Keep,” or COBAK. COBAK is a default interconnection regime, which would apply only when two networks have not reached an alternative agreement on the terms for interconnection. In contrast to the existing patchwork of interconnection regimes, COBAK is a unified approach to interconnection pricing, applying to all types of carriers that interconnect with, and to all traffic that passes over, the local, circuit-switched network. Thus, COBAK applies to local, interstate, and intrastate toll traffic, and to interconnection agreements between competing local carriers, adjacent local carriers, wireless and wireline carriers, and local and long-distance carriers.

A. *The COBAK Rules*

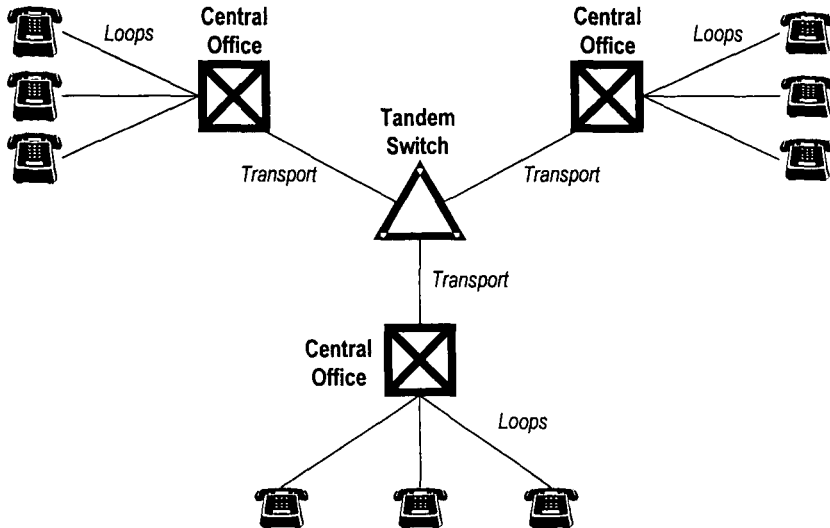
For purposes of this discussion, consider a telecommunications network as consisting of two parts: (1) local access facilities, consisting of the loops serving the customers’ premises and the central office switches serving the customers’ loops, and (2) transport facilities, consisting of both inter-office trunks and tandem switches.³⁹ “Termination” will be defined

³⁸ More specifically, because carriers will view traffic-sensitive interconnection charges as raising their marginal costs, they will tend to raise their traffic-sensitive retail prices even though the underlying cost structure of the networks may be non-traffic-sensitive.

³⁹ A loop connects the customer and the central office that switches a call onto the transport network. The term “loop” can refer either to the traditional wireline facility that connects a customer’s

as the delivery of a call by the called party’s network over the local access facilities to the called party. “Transport” will be defined as the routing and

Figure 1: Three Central Offices Connected Via Tandem Switch



delivery of a call from the calling party’s central office to the called party’s central office.⁴⁰ (See Figure 1.)

A customer’s premises is connected by a “loop” to the central office (or switch) that serves him. A call to a customer served by another central office must be transported from the calling party’s central office to the called party’s central office. In Figure 1, the transport trunks connecting the central offices meet at a tandem switch. A tandem switch acts as a central “hub” that aggregates traffic from the originating central offices and routes traffic to the destination central offices. It is also possible (and quite often the case) that two central offices are connected by a dedicated transport trunk with no intervening tandem switch.

premise to a switch, or a wireless connection, whether fixed or mobile, between a customer and the switch of the wireless network. The central office can be viewed as a place in the network where loops are aggregated and calls are switched onto the transport network. *See infra* Section IV.A.

⁴⁰ Cf. Local Competition First Report and Order, *supra* note 29, ¶¶ 1039-40, at 16,015 (defining *termination* as “the switching of traffic that is subject to § 251(b)(5) at the terminating carrier’s end office switch (or equivalent facility) and delivery of that traffic from that switch to the called party’s premises,” and *transport* as “the transmission of terminating traffic that is subject to § 251(b)(5) from the interconnection point between the two carriers to the terminating carrier’s end office switch that directly serves the called party (or equivalent facility provided by a non-incumbent carrier).”

Utilizing these definitions, COBAK can be described in terms of two basic default rules. The first rule specifies how the cost of local access facilities should be recovered, while the second specifies which network is responsible for the cost of transport. For simplicity, let us begin by considering calls that traverse just two networks, such as a local call that originates on one local network and terminates on another local network in the same local calling area.

Rule 1: No carrier may recover any costs of its customers' local access facilities from an interconnecting carrier.

Rule 1 means that the called party's network cannot charge the calling party's network to recover any costs associated with either the called party's loop or the switch that serves that loop. Thus, each carrier will recover the cost of local access facilities from end-user customers.

Rule 2: For calls traversing two networks, the calling party's network is responsible for the cost of transporting the call to the called party's central office.

Rule 2 requires that the calling party's network either provide its own transport facilities or pay another carrier, including possibly the called party's carrier, to transport the call to the central office serving the called party.

The following examples illustrate these rules. First, suppose that there are two networks, and each builds its own transport facilities to connect its network to the other network's central offices. In this case, the calling party's network would deliver a call from the calling party to the central office of the called party, where the called party's network would then terminate the call. Since both networks in this example possess their own transport facilities, the networks would self-provide transport and exchange traffic at the central offices of the called party on a bill-and-keep basis—hence the name “Central Office Bill and Keep.” Now suppose that a calling party's carrier physically interconnected at some point on the called party's network other than at the called party's central office, such as at a tandem switch. In this case, the calling party's network would pay the called party's network for the use of the tandem switch and for transport links to the central office. It would not, however, pay a termination charge to contribute to the cost of the central office switch or the loop. Finally, a carrier could satisfy Rule 2 by leasing transport facilities or purchasing transport services from a third party. This last

option is becoming more attractive as the market for transport becomes increasingly competitive.

For calls traversing three networks, such as a long-distance call carried by an IXC, the first rule remains the same, while the second rule requires a slight modification. Under COBAK, the calling party is responsible for all of the costs of transport to the central office serving the called party. The calling party typically satisfies this responsibility by contracting with both a local network that originates the call and an interexchange network that transports the call from the calling party's local network to the called party's central office. More specifically, under COBAK, the calling party's local carrier is responsible for carrying the call from the calling party to the POP of the calling party's IXC. The calling party's IXC is then responsible for carrying the call to the central office serving the called party. As with a local call, the called party's network is responsible for the cost of terminating a call over the local access facilities.

COBAK, therefore, differs from the current access regime in that it eliminates all originating access charges. It also eliminates any terminating access charges intended to recover the cost of the loop or the terminating central office. COBAK does not, however, eliminate access charges for terminating transport if the IXC uses the terminating LEC's transport facilities.

Notice that, in an interexchange call, the calling party's local network is responsible for delivering the call to the IXC's POP, just as it is responsible, in the case of a two-network call, for delivering the call to the central office of the called party. Thus, Rule 2 may be modified as follows:

Rule 2A: For interexchange calls, the calling party's local network is responsible for delivering the call to the POP of the calling party's IXC; the calling party's IXC is then responsible for delivering the call to the called party's central office.

It is worth reiterating that COBAK is a default interconnection regime, which would apply only if two interconnecting carriers did not independently reach a negotiated agreement on the terms of interconnection. It does not constrain in any way the types of agreements carriers would be allowed to negotiate.

This does not mean that the COBAK rules will not influence negotiated outcomes. Default rules will largely determine the outcome of negotiation. For example, Rule 2 will likely create incentives for interconnecting networks to establish a meet point between their two networks and to exchange traffic within a specific geographic area on a

bill-and-keep basis at that point. To the extent that two carriers have relatively balanced traffic exchanges, they are likely to find it in their mutual interest to agree to such a meet-point arrangement. This arrangement is likely to be less expensive than each carrier building its own separate transport facilities to each central office of other networks.⁴¹ Similarly, several networks could agree to establish a common point of interconnection or network access point (similar to those on the Internet) and exchange traffic on a bill-and-keep or other agreed upon basis at such a point.⁴²

It is also worth pointing out that COBAK represents an approach to interconnection pricing between carriers; it does not specify how retail rates should be set. To the extent that local switch costs that were formerly recovered through access charges will be recovered from end users, COBAK does not specify how those costs should be recovered. COBAK would not preclude regulators from simply shifting the per-minute, local-switching access charges from the IXC to the LEC's customer.⁴³

Finally, COBAK does not preclude alternative retail relationships between a carrier and an end user. For example, it would not be inconsistent with COBAK for an IXC to offer an "800" service in which the called party pays the IXC the cost of transporting the call and access fees. Nor would COBAK preclude a "calling-party-pays" service, such as a "900" service, where the called party's carrier bills calling parties (often through the calling party's carrier) for the cost of terminating a call.⁴⁴ In fact, a carrier seeking to offer a "calling-party-pays" service could even negotiate with the calling party's network to have the latter network act as the collection agent. COBAK would preclude only the terminating

41 Even if traffic is not balanced, interconnecting networks are still likely to have an incentive to share the cost of building shared transport links. Provided that both networks originate some traffic and that it is cheaper to build a single shared transport facility than two separate transport facilities, the parties will have an incentive to agree to a shared facility whose cost would be split in some way between the two carriers.

42 In fact, it has been proposed that the Commission establish such points of interconnection and require networks to interconnect on a bill-and-keep basis at such points. Douglas A. Galbi, *Transforming the Structure of Network Interconnection and Transport*, 8 *COMMLAW CONSPPECTUS* 203 (2000). While there are clearly some advantages of such an arrangement, such as eliminating the need to determine what qualifies as a central office, it creates administrative problems of its own, including determining where such points would be located, who would run such interconnection points, and how the quality level of interconnection would be determined and maintained.

43 See *infra* Section IV.F.

44 Such "calling-party-pays" services are commonly offered by wireless carriers in other countries. In addition, the Commission addressed this issue in *In re Calling Party Pays Service Offering in the Commercial Mobile Radio Services*, 14 F.C.C.R. 10,861 (1999) (Declaratory Ruling and Notice of Proposed Rulemaking). Of course, such calling-party-pays arrangements create a terminating access problem. See, e.g., OFFICE OF TELECOMMUNICATIONS, PRICE CONTROL REVIEW ¶¶ 2.32-.35 (2000) (discussing need to regulate price of calls made by wireline customers to wireless customers).

carrier's demand that the originating carrier pay the cost of terminating a call as a condition for interconnection.

B. Illustrative Applications of the COBAK Rules

The following examples illustrate how COBAK would apply to a number of different interconnection scenarios.

Example 1—A Local Call Between Two Networks Interconnecting at the Central Office. (See Figure 2.) Suppose there are two local networks in a city, *A* and *B*, each of which owns one local switch. In addition, assume that *A* owns a transport trunk connecting its switch to *B*'s switch. In this case, for calls originating on *A*'s network, *A* will use its own transport facilities to deliver calls to *B*'s central office, and it will not have to pay *B* to terminate these calls. Thus, for these calls, interconnection occurs on a bill-and-keep basis at *B*'s central office.

Suppose now that one of *B*'s customers originates a call to a customer on *A*'s network. *B* is responsible for the cost of transporting the call to *A*'s central office. To satisfy this responsibility, *B* could either build its own transport trunk, pay to use *A*'s transport facilities, or purchase transport from a third party. *B* would not pay *A* for any costs associated with termination.

Example 2—A Local Call Between Two Networks with Interconnection at a Tandem Switch. (See Figure 3.) Again, assume that

Figure 2: Example 1

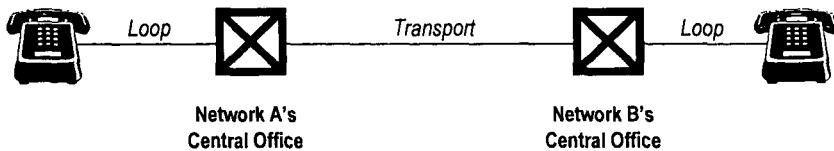
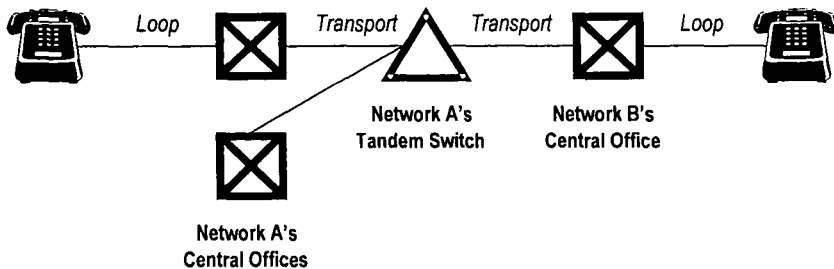


Figure 3: Example 2



there are two local networks, but this time assume that *A* has several central offices connected to a tandem switch while *B* has just one central office switch. Finally, assume that *B* interconnects with *A* at the tandem switch. If a customer of *B* calls a customer of *A*, *B* would have to pay *A* for the cost of tandem switching and transport from the tandem to the called party's central office. *B* would not have to pay termination costs, however, because *A* could not charge *B* for any part of the cost of the local switch or the called party's loop.

Suppose now that a customer of *A* calls a customer of *B*. *A* could carry the call to *B*'s central office, in which case it would owe *B* nothing. Alternatively, *A* could choose to use *B*'s interconnection trunks. In this case, *A* would have to pay *B* for transport from the tandem switch to *B*'s central office, but *A* would not have to pay *B* for termination.

Example 3—A Long-Distance Call Involving an IXC. (See Figure 4.) Suppose that a customer wants to make a long-distance call. The calling party's local carrier is responsible for delivering the call to the POP, of the calling party's IXC. This cost can only be recovered from its customer, the calling party. The calling party's IXC is then responsible for delivering the call to the central office serving the called party. It recovers this cost from the calling party. Finally, the terminating local carrier serving the called party is responsible for delivering the call from the central office to the called party, and it recovers the termination costs from its end user, the called party. As discussed above, the only access charges the IXC might have to pay are for transport to the local central office of the called party.

Example 4—A Long-Distance Call Involving a LEC with No Direct Connection to the IXC. (See Figure 5.) Suppose a rural LEC connects indirectly to the POP of an IXC by "transiting" the network of a larger adjacent LEC. For an interexchange call made by the rural LEC's

Figure 4: Example 3

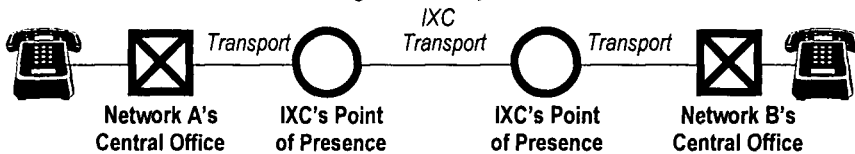
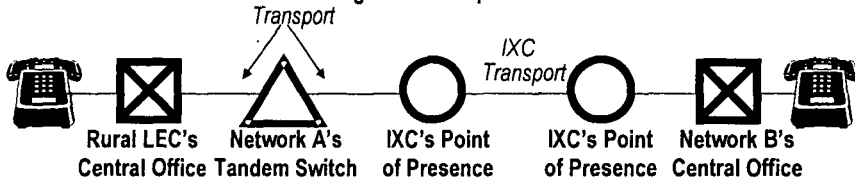


Figure 5: Example 4



customer, the rural LEC is responsible for delivering the call to the IXC's POP. In this case, the rural LEC will have to pay a transport charge to the larger adjacent LEC to have the latter transport the call from the rural LEC's point of interconnection with the large LEC's networks to the IXC's POP.

Suppose now that the rural carrier's customer is a recipient of a long-distance call. In this case, COBAK dictates that the IXC is responsible for transporting the call to the rural LEC's central office serving the called party. This means that the IXC will have to pay transport charges to the large LEC for transiting services that allow it to reach the rural LEC's network, as well as to the rural LEC for transport from the rural LEC's point of interconnection with the large LEC to the called party's central office.

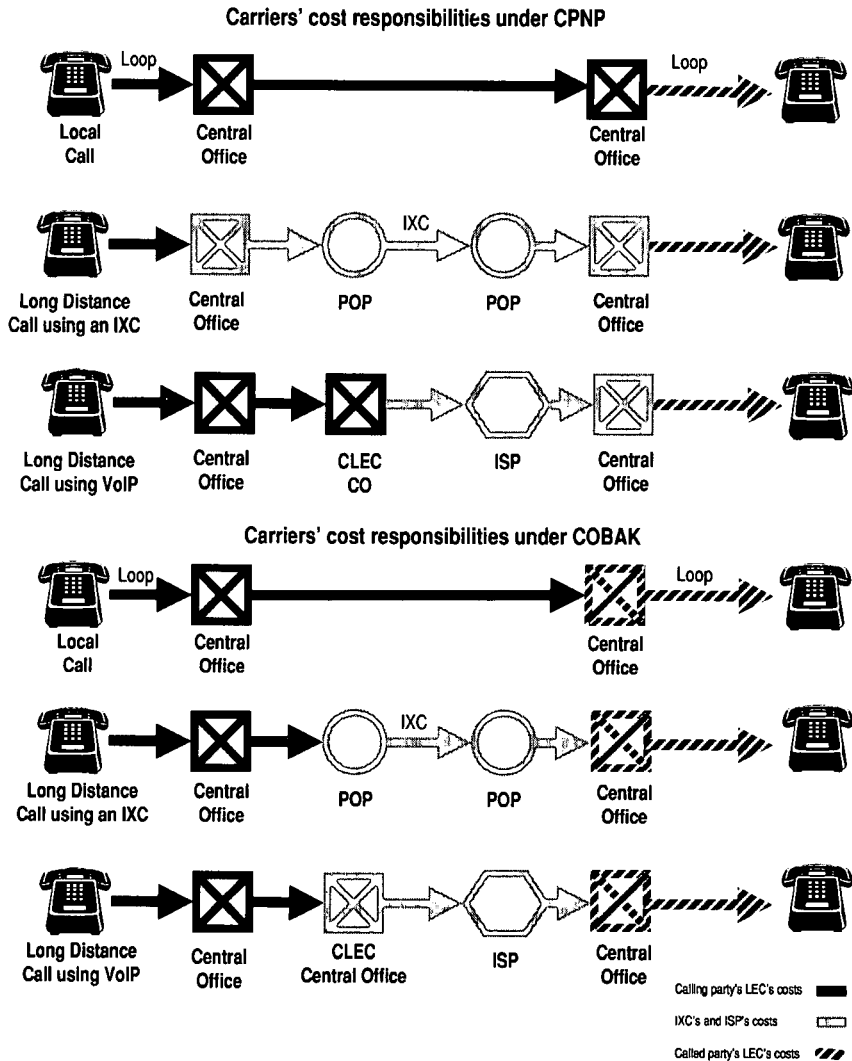
It may be helpful to compare COBAK to existing interconnection regimes. (See Figure 6.) With respect to local calls, COBAK resembles existing reciprocal compensation rules in making the calling party's network responsible for the cost of transporting the call to the central office of the called party. However, COBAK differs from the existing reciprocal compensation scheme in that the called party's carrier cannot recover from the calling party's network the cost of terminating the call over the called party's local access facilities.

For interstate and intrastate long-distance calls, COBAK represents a more significant departure from the existing access charge regime. As previously mentioned, the IXC under COBAK will pay no originating access charges to the calling party's local carrier, nor will it pay local switching or carrier-common-line charges to the called party's local carrier. At most, it will pay only the called party's local carrier for transport from the POP to the central office, should it choose to use the transport facilities of the called party's local carrier.

Under CPNP, the cost responsibility of the calling party's ILEC's depends on whether the call is local or long-distance, the IXC and the ISP have different cost responsibilities for performing the same long-distance transport function, and the called party's network is a monopolist with respect to terminating switching vis-à-vis the interconnecting carrier. Under COBAK, the called party's LEC has the same cost responsibility for all calls, the ISP and the IXC have the same cost responsibility for long-distance transport, and the called party's LEC collects termination costs from its own customers.

It is worth emphasizing that this Article is not proposing that COBAK be made the default for interconnection negotiations among Internet backbones. Internet backbones have been able to negotiate interconnection

Figure 6: Comparison of carriers' cost responsibilities under CPNP and COBAK



agreements among themselves without any regulatory intervention so far, and there appears to be no good reason to modify the existing system.

C. *Negotiations Under COBAK*

While the COBAK rules require as a default that each carrier bear the entire cost burden of transporting calls originated by their customers, it is likely that, in many situations, carriers will negotiate interconnection agreements where they would effectively split the cost of transport. Specifically, the default transport rule suggests that two interconnecting

networks would build their own one-way trunks to the central offices of the other network. However, in many cases, it would be less expensive for the carriers to jointly build a single two-way trunk between the networks. Thus, it will be in the interest of both carriers to negotiate a meet-point interconnection or similar arrangement for the construction and operation of such a facility. Thus, even though COBAK requires the originating carrier to bear all of the costs of transport of a call originated by its own customer, carriers may nevertheless negotiate arrangements in which they effectively split the cost of transport of calls between their networks regardless of who originates the call.

It should be noted that, where one of the networks exclusively (or primarily) receives traffic, COBAK might not result in a negotiated bill-and-keep arrangement. In that case, because the one-way network would not be delivering traffic, the carrier would not need to build its own transport facilities under the default rule and therefore would have no incentive to share the cost of a meet-point arrangement. It is not clear how significant a problem this will prove in practice, however. First, most networks do originate some traffic, and, to the extent they do, they will have an incentive to negotiate some cost-sharing arrangement. Second, although COBAK does not solve this problem, it still represents an improvement over the existing reciprocal compensation regime, where one-way networks not only do not have to share the cost of transport but are also paid to terminate incoming traffic. At least, COBAK eliminates the inefficient incentive created by existing termination charges. Finally, as discussed below, additional remedies can limit the extent to which “receive-only” networks can impose transport costs on other networks.⁴⁵

III. Theoretical and Policy Justifications for COBAK

Part II laid out the COBAK proposal and provided examples of how it would apply to various interconnection scenarios. This Part describes the theoretical and policy rationales underlying the COBAK proposal. More specifically, this Part first discusses the appropriate goals of an interconnection pricing regime in competitive markets. It next discusses the critical assumptions underlying the prevailing CPNP interconnection regimes—that the calling party is the sole cost-causer and sole beneficiary of a call—and explains why those assumptions are unrealistic and need to be reconsidered as competition is introduced into telecommunications markets. The Part then explains the implications for interconnection pricing and of adopting the more realistic assumption that both parties to a call cause and benefit from the call. Finally, the Part lays out the

45 See *infra* Section IV.B.

theoretical and policy justifications for the two COBAK rules. In this regard, the Part also explains how COBAK's default rules would encourage parties to negotiate efficient interconnection agreements.

A. *The Appropriate Goals of an Interconnection Pricing Regime in Competitive Markets*

There is general, though not universal, agreement that some regulation of interconnection between ILECs and entering competitors is required. As suggested above, this is because small new networks need interconnection with large networks in order to attract customers and compete with incumbents. Without such interconnection, small networks could provide connection to only a few customers, severely limiting the value of their network. Large incumbent networks, consequently, have a strong incentive to refuse to interconnect at all or to interconnect only on terms or conditions that would competitively disadvantage their new competitors.⁴⁶

While suggesting the need for some form of interconnection regulation, these observations do not explain which form of interconnection regulation is most desirable from society's perspective. Moreover, regulators historically have used interconnection policy to achieve a variety of objectives, which have not always been clearly articulated.⁴⁷ Finally, the regulatory objectives of certain interconnection regimes appear to conflict. For example, building implicit subsidies into interconnection rates might encourage universal service, yet it is inconsistent with the goals of encouraging the efficient use of the network by customers, the efficient deployment of facilities by carriers, and the efficient development of competition. Similarly, as discussed below, an interconnection regime that leads to efficient use of the network may be consistent with reduced regulation over time.⁴⁸

With the introduction of competition into telecommunications markets, particularly at the local level, regulators need to limit the

46 See Local Competition First Report and Order, *supra* note 20, ¶ 10, at 15,508 ("Because an ILEC currently serves virtually all subscribers in its local serving area, an ILEC has little economic incentive to assist new entrants in their efforts to secure a greater share of the market. An ILEC also has the ability to act on its incentive to discourage entry and robust competition by not interconnecting its network with the new entrant's network or by insisting on supracompetitive prices or other unreasonable conditions . . .") (footnotes omitted); see also Mark Armstrong et al., *The Access Pricing Problem: A Synthesis*, 44 J. INDUS. ECON. 131, 131-32 (1996) (analyzing various pricing rules to regulate this pricing strategy); Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424 (1985); Robert D. Willig, *The Theory of Network Access Pricing*, in ISSUES IN PUBLIC UTILITY REGULATION 109, 146 (Harry M. Trebing ed., 1979).

47 See, e.g., LAFFONT & TIROLE, *supra* note 14, at 98-99 (noting that interconnection regulation generally "must reflect multiple objectives").

48 See *infra* Section III.B.

objectives they seek to accomplish with interconnection policy in order not to distort the development of competition.⁴⁹ In particular, regulators need to focus on designing an interconnection regime that (1) encourages consumers to make efficient use of telecommunications networks, (2) encourages entering and incumbent networks to make efficient investment in, and deployment of, network infrastructure, (3) will be viable as competition develops, and (4) minimizes regulatory costs.⁵⁰ Such regulatory costs include both the administrative costs of regulation and costs associated with market distortions resulting from regulatory mistakes or imperfect information on the part of the regulator, which might, for example, lead to a miscalculation of interconnection costs.

B. *Revisiting the Assumptions Underlying the Current CPNP Interconnection Regime*

Economic analyses of interconnection pricing have generally assumed that the calling party is the sole cost-causer and the sole beneficiary of a call. While these assumptions may have been a useful means of simplifying the analysis of various interconnection pricing problems, they have long been recognized as unrealistic,⁵¹ and, with the growth of competition in telecommunications, they need to be reconsidered.

As competition was introduced into the long-distance market, economists began considering the price that an incumbent local telephone company, controlling a bottleneck facility, should charge a long-distance company for access to its network.⁵² A particular focus of these studies was how to set the price of access along with the prices of other retail services offered by an incumbent carrier, so as to achieve efficient usage of the network while simultaneously taking account of network externalities and recovering the large, fixed costs exhibited by local

49 To the extent that regulators seek to achieve other goals as well, they should address them separately from interconnection policy. Especially with the introduction of competition, regulators need to take care that their efforts to achieve these other goals do not distort the efficient development of competition.

50 See *infra* Part IV for a discussion of how current problems, which would be addressed by attaining these goals, are solved by COBAK.

51 See, e.g., Lyn Squire, *Some Aspects of Optimal Pricing for Telecommunications*, 4 BELL J. ECON. & MGMT. SCI. 515, 518-19 (1973) (discussing the benefit to the called party); Willig, *supra* note 46, at 124-28 (discussing the fact that the called party generally benefits from a call).

52 Early studies included Roland Artle & Christian Averous, *The Telephone System as a Public Good: Static and Dynamic Aspects*, 4 BELL J. ECON. & MGMT. SCI. 89 (1973); Jeffrey Rohlfs, *A Theory of Interdependent Demand for a Communications Service*, 5 BELL J. ECON. & MGMT. SCI. 16 (1974); Squire, *supra* note 51; and Willig, *supra* note 46. For more recent studies, see, for example, Armstrong et al., *supra* note 46; Jean-Jacques Laffont & Jean Tirole, *Access Pricing and Competition*, 38 EUR. ECON. REV. 1673 (1994); Jean-Jacques Laffont et al., *Network Competition: Overview and Nondiscriminatory Pricing*, 29 RAND J. ECON. 1 (1998); and Jean-Jacques Laffont et al., *Network Competition: Price Discrimination*, 29 RAND J. ECON. 38 (1998). See generally LAFFONT & TIROLE, *supra* note 14, at 102-04.

telephone networks. To make their analyses tractable, these models tended to assume that the calling party was the sole cost-causer and sole beneficiary of the call.⁵³

The introduction of competition in local markets has introduced additional interconnection issues for which this assumption is inappropriate. Models employing this assumption do not recognize important institutional realities of the telecommunications marketplace, including the fact that both parties to a call typically benefit from the call, terminating carriers have market power over the price of termination, and maintaining a termination-charge regime requires high regulatory costs. Given these new issues, it is necessary to reconsider this assumption, which has been made in these earlier studies. As discussed below, it is critical to recognize that both the calling party and called party jointly cause the call and benefit from it. Adopting these more realistic assumptions leads to alternative interconnection pricing regimes that solve many of the problems facing the existing regime.

With respect to the cost of a call, it is only a slight over-simplification to say that the cost a network incurs from completing a phone call is the cost of having a circuit used during the call. This “congestion” cost is the same for a network whether the call is originated by its end-user customer or received by its end-user customer.⁵⁴ Thus, with respect to resources used in a call, both the calling party’s and called party’s networks should be essentially indifferent as to whether their customer originated or received a particular call.

With respect to cost causation, it has been argued that if the calling party had not initiated the call, then the call would not have been made. Thus, the calling party is the cost-causer and should be charged all the costs of the call. This reasoning is wrong for at least two reasons. First, even if we grant that the call would not have occurred if the calling party had not initiated it, it is equally true that the call could not have continued without the consent of the called party. Thus, any costs incurred by networks for the duration of the call are a result of a joint decision of the calling party and the called party to continue the call. Therefore, the

53 Although these earlier studies assumed (at least implicitly) that the calling party was the sole beneficiary of the call, the authors of the studies, as previously indicated, clearly recognized that, in reality, both parties tended to benefit from calls. *See, e.g.*, Squire, *supra* note 51, at 518-19; Willig, *supra* note 46, at 124-28. These authors were willing to make this simplifying assumption apparently because they believed that the parties to the call could internalize the cost of the call. *See* Willig, *supra* note 46, at 128.

54 Of course, there may also be certain call set-up costs associated with initiating a call. These costs do not undermine the basic point, however, that both parties are responsible for continuing a call.

calling and the called party are jointly responsible for all costs incurred during the duration of the call.⁵⁵

Second, with respect to benefits, it must be recognized that, for the vast majority of calls, both parties will receive some benefit. For example, the fact that a customer who, upon listening to his answering machine, calls someone who had left a message suggests that both parties to the call clearly expect to receive a benefit. Similarly, businesses that take “800” service, such as mail-order catalog companies, and other businesses that depend on incoming calls, such as pizza-delivery services, are further examples of parties who clearly benefit from incoming calls. Finally, while it is true that people receive some unwanted calls (for example, from telemarketers), it appears that these calls represent a small fraction of telephone traffic and thus hardly present the basis upon which to build an entire interconnection regime. This is particularly true given the ability of called parties to simply hang up on unwanted calls. As I will explain below, if customers share the benefits of calling, efficiency dictates that they must share the costs.

Thus, in contrast to earlier economic analyses of interconnection pricing, it appears more appropriate to assume that both parties jointly cause the call and share in its benefits. I now consider some of the implications of changing the traditional assumptions. In order to simplify the discussion, I will further assume that the two networks have equal costs and that, on average, the called party and the calling party share equally in the benefit of a call.⁵⁶

C. *Implications of Revising the Assumptions Concerning Cost Causation and Benefits*

One clear implication of the traditional assumption that the calling party is the sole cost-causer and sole beneficiary of a call is that the calling party should bear the full incremental cost of the call. This assumption provides the theoretical basis for CPNP regimes. If, instead, we assume that both parties benefit and jointly cause a call, then this suggests that a

55 As a general matter, it is not true that, if the calling party did not make the call, then the call would not be made. As a simple counter-example, suppose a customer on network *A* calls a customer on network *B*. When the called party does not answer the phone, the calling party leaves a message on the answering machine. If the customer on network *B* subsequently retrieves the message and calls back, whom should we say is the initiator or causer of the call? If the customer on *B*'s network would not have called the customer on *A*'s network but for the voice mail, then we might conclude that the customer on *A*'s network is the initiator or causer of the call even though the customer on *B*'s network is the one who dialed the successfully completed call.

56 Relaxing this assumption to recognize that different networks may have different costs does not change the basic results of this analysis; nor does it undermine the two COBAK rules. See *infra* Section II.E.

CPNP regime in which the calling party bears the entire incremental cost of the call will not be efficient. This point is briefly developed below.

1. Efficient Usage by Customers

It is well established in economics that, for private goods and services⁵⁷ that are individually consumed by specific customers, the price should be set equal to marginal or incremental cost of production in order to encourage efficient consumption decisions.⁵⁸ Setting the price equal to incremental cost ensures that each customer will purchase the efficient quantity (i.e., all units for which the benefit he receives equals or exceeds the cost of the resources used to produce the good or service), and no units for which the benefit is less than cost.

Where a good or service is jointly consumed by more than one consumer, such as a phone call, the analysis becomes slightly more complicated.⁵⁹ In the case of a phone call, for example, the total price paid by both parties for a minute of calling should be set equal to the incremental cost of providing that minute. Further, each customer should pay a share of this total price equal to the share of the benefit he receives from the call. In the case of a phone call, the efficient quantity is consumed when the parties jointly consume all minutes of calling for which their joint benefit is greater than or equal to the incremental cost of producing the minute, and no minutes for which their joint benefit is less than the incremental cost of producing a minute.

Thus, if the parties to a call benefit equally from the call, then, in order to achieve efficient consumption levels, each party should pay a price equal to one-half the incremental cost of the call.⁶⁰ In this case, each party will choose to consume minutes up to the point at which his private

57 See, e.g., James M. Buchanan, *An Economic Theory of Clubs*, 32 *ECONOMICA* 1 (1965) (discussing the differences between private and public goods).

58 See, e.g., 1 ALFRED E. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS* 65-70 (1970).

59 See Buchanan, *supra* note 57.

60 There are two possible complications to this analysis that should be noted. Neither complication should change the basic conclusion, however.

First, one needs to consider the implications if the two parties to a call do not benefit equally (in the sense of having identical demand functions). See *infra* Section II.E for a discussion of the analysis when the calling party on average receives a larger share of the benefit than the called party.

Second, one needs to consider the implications of two networks having different costs. In general, a network with higher costs should offer greater services. For example, a mobile wireless network may have higher termination costs than a wireline network, but it offers its customers the advantage of mobility. Similarly, a broadband network may have higher costs, but again it may offer its customers the advantage of additional services. Further, if one were to accept that the average cost of switching is higher in sparsely populated areas than urban areas, those who choose to live in rural areas presumably receive more benefits from this choice than living in urban areas. To the extent that differences in cost are due to differences in the benefits received by customers, it appears reasonable to require the party choosing the more expensive network to pay for the additional costs of that network.

benefit equals just half the incremental cost of providing an additional minute. Therefore, together they would consume to the point at which their joint benefit equaled the incremental cost, satisfying the condition for efficiency.

2. Efficient Pricing by Carriers

The above analysis suggests that customers who share equally in the benefit of a call would make efficient consumption decisions if they faced retail prices that evenly divided the cost of a call between them. Thus, the next question becomes what interconnection pricing regime will give carriers the incentive to set such prices?

If there is no inter-carrier compensation, then carriers must recover the cost of termination directly from their end-user customers.⁶¹ When carriers each contribute half of the facilities needed to complete a call, they will each incur half of the cost. If their retail rates are designed to recover their cost (including a reasonable profit), then a zero interconnection charge will result in retail rates that divide the cost of a call evenly between parties to the call. If there is sufficient competition for end-user customers, then competition ensures that carriers will charge prices that, on average, just recover these costs. If, on the other hand, there is insufficient competition, then the regulator will have to regulate the prices charged by dominant carriers (i.e., those with individual market power) to ensure end-user charges that just recover cost. However, the regulator should not have to regulate the rates charged by non-dominant carriers.⁶² As competition develops, the regulator should be able to relax regulation of all end-user rates.

It is important to note that the ability of bill and keep interconnection to generate efficient retail rates depends only on the relative share of the benefit received by the two parties and the costs of the two networks. It does not depend at all on the balance of traffic between the two networks. Thus, bill and keep can be efficient even if traffic between two networks is significantly unbalanced.

61 For now, we abstract away from the possibility of carriers offering "800" and "900" services.

62 See, e.g., In re Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Therefore, 85 F.C.C.2d 1, 31-35 (1980) (First Report and Order) [hereinafter Competitive Carrier First Report and Order] (discussing why it is unnecessary to regulate the rates of non-dominant carriers).

D. *Rationale Underlying the COBAK Rules*

This Section applies the analysis of the previous Section in explaining the economic and policy rationales behind each of the COBAK rules. The Section first shows how the above analysis directly supports Rule 1 of COBAK—that carriers recover local access costs from their end-user customers. The Section then explains why Rule 2 of COBAK—that carriers are responsible for the cost of transporting calls to the called party's local central office—deviates somewhat from the above analysis. Finally, the Section explains how the COBAK default rules should lead to efficient and successful negotiations between carriers in the majority of circumstances.

1. Rationale for Rule 1: Why the Costs of Local Access Should Be Recovered from End-User Customers

The main rationale for Rule 1 follows directly from the above analysis. Specifically, if both parties benefit equally from a call, then they should share equally in the cost of the facilities necessary to provide the call. Rule 1 will divide the cost of local access between the calling party and the called party by requiring that each party pay for his own loop and local switching costs.

Of course, not every call will equally benefit the calling party and called party, and, accordingly, no simple, uniform interconnection rule can ensure that the cost of every call will be allocated proportionately to the benefits received by each party to the particular call. Nevertheless, it has been shown that if, on average, both parties to a call benefit equally, then a system in which the parties share the cost of the call will provide an efficient cost recovery mechanism, one that is more efficient than a system in which the calling party bears the entire cost of the call.⁶³

There are other reasons that justify Rule 1 as well. As discussed below,⁶⁴ COBAK should (1) significantly reduce the terminating monopoly access problem; (2) allow carriers greater flexibility to achieve efficient end-user rate structures (rather than rely on per-minute charges to recover inter-carrier charges); and (3) create incentives for carriers to choose network design and technology efficiently.

63 DeGraba, *supra* note 10.

64 *See infra* Part IV.

2. Rationale for Rule 2: Why the Calling Party's Network Should Bear the Cost of Transport

The above analysis suggests that, if the parties to a call benefit equally from the call, they should share equally in its costs, including the cost of transport. Rule 2 does not require such equal sharing, however. Rather, it requires that the calling party's network bear the entire cost of transport. Rule 2 diverges from this theoretical prescription of equal cost-sharing when parties share the benefit of a call equally for the reasons explained below.⁶⁵

First, Rule 2 is a default that can be implemented without the cooperation of the interconnecting network. That is, in the absence of any negotiated agreement, COBAK gives one network the right to bring its transport facilities to the central office of the called party and interconnect there on a bill and keep basis.⁶⁶ A rule requiring two interconnecting networks to divide equally the cost of transport requires those two carriers to agree on a transport network. In the absence of such an agreement, a default rule could not be implemented.

Even if the two carriers agreed on the structure of the transport network, it would still be difficult to determine which costs would constitute the appropriate costs of transport. The following example illustrates this problem. Suppose that network *A* has several switches connected to a tandem switch, while network *B* has a single switch. Suppose further that *A* and *B* agree to interconnect midway between *A*'s tandem and *B*'s switch. In this scenario, the incremental cost of transport is not simply the cost of the transport trunk connecting *A*'s tandem and *B*'s switch. Rather, *A* would likely have to increase the capacity of its interoffice trunks and possibly the capacity of its tandem and end-office switches as a result of interconnection, and *B* might have to increase the capacity of its single switch. In other words, the incremental transport costs attributable to interconnection may not be limited to the cost of the physical trunks linking the two networks but may also include certain incremental costs of expanding other portions of the network to handle changing traffic patterns. These incremental interconnection costs, however, are likely to be difficult to estimate and subject to considerable debate.

Second, Rule 2 allows each carrier to design its own transport network without the need to reach agreement with competing networks.

65 See *infra* Section II.E for a discussion of why Rule 2 can be consistent with the assumption that the calling party on average receives more of the benefit from a call than the called party.

66 Of course, as discussed below, an entrant can obtain transport from the incumbent as an unbundled element. See *infra* Section IV.E.

Rather, each carrier will be free to design its transport network so as to best serve the needs of its customers. For example, in the case of a new entrant interconnecting with an incumbent carrier, the new entrant can decide whether to have dedicated transport trunks to each of the incumbent's central offices or to interconnect at the incumbent's tandem switch and purchase tandem-switched transport. In addition, each carrier can decide the capacity of its dedicated interconnection trunks, which will determine the quality of service provided. Of course, cooperation among carriers to design a network is allowed, but is not required.

Third, the rule can be implemented when more than two networks are involved in carrying a call. It is always the responsibility of the calling party to cover the costs of transporting the call to the called party's central office. He may do so using a single network (such as a LEC) or multiple networks such as a LEC and an IXC. It is not at all clear how one would distribute transport costs where a call involved three or more networks. While it is possible to imagine a generalization of the "split-the-cost" rule for transport costs where three or more networks are involved, such a rule would likely be complicated and difficult to implement.

E. *Relaxing the Assumption that Parties Share Equally in the Benefits of the Call*

The above analysis assumes that both parties to a call benefit equally from the call. However, the analysis does not depend on this assumption and can be generalized to other divisions of the benefit of a call between the parties. In general, efficient utilization of the network will occur when each party to a call incurs a share of the incremental cost of the call equal to his share of the benefit from the call. Thus, for example, if the calling party receives sixty-five percent of the benefit of a call, then he should pay for sixty-five percent of the incremental cost. Note that this general rule is consistent with the statement that, if customers share equally in the benefits, they should share equally the incremental costs.

If one were to assume that the calling party received more of the benefit than the called party, it would still be possible for COBAK to yield efficient rates. For example, where carriers do not negotiate a meet point interconnection arrangement, the calling party's network will bear more of the incremental cost of a call than the called party's network (since the calling party's network bears all of the transport costs). To the extent that the share of the incremental costs borne by the calling party's network is approximately equal to the share of the benefit received by the calling party, retail rates would be close to efficient. Where carriers do negotiate a meet-point billing arrangement and bear equal shares of the cost of the call (to the extent that the calling party's share of the benefit is close to fifty

percent), COBAK will likely result in more efficient rates than a CPNP regime, in which the calling party's network bears the entire incremental cost of a call.

Finally, generating efficient retail rates is only one goal of interconnection policy. As noted above, other issues involving incentives to engage in regulatory arbitrage and distortions in the incentives to invest efficiently are also important. These issues do not depend on how the benefits of a call are divided among the parties. Thus, that analysis is valid regardless of the actual division of benefits between parties to a call.

IV. Existing Interconnection Problems Solved by COBAK

The previous Part outlined the theoretical and policy justifications for the COBAK proposal. This Part discusses a number of serious problems affecting existing interconnection regimes that COBAK either eliminates or ameliorates.

A. *Problems of Regulatory Arbitrage*

Perhaps the most important problems facing existing interconnection regimes are the opportunities for regulatory arbitrage that they create. The two most important arbitrage opportunities, in economic terms, are discussed below.⁶⁷

1. Access Charge Arbitrage

One source of arbitrage arises from the disparate treatment of interexchange and local telephone calls. Under current regulations, the calling party's LEC collects originating access charges from its customer's pre-subscribed IXC when that customer makes a long-distance call. Because the IXC passes on such charges in higher per-minute long-

⁶⁷ There are other sources of regulatory arbitrage as well. For example, large end users may employ Private Branch Exchanges ("PBXs") on their premises. In some cases, such PBX customers may also employ leased lines to connect multiple PBX's at distant locations (such as at different regional offices). These leased lines permit employees to call other employees at remote offices without incurring access charges. In some private networks, however, employees can also place "off-net" calls that traverse the leased line and then "hop off" onto the local exchange network. Because these off-net calls are treated like any other call from the PBX, access charges do not apply. This problem of the "leaky PBX" caused a sufficient erosion in access charges that the Commission imposed a twenty-five dollar per month charge for each leased trunk that could "leak" traffic into the public switched network. See 47 C.F.R. § 69.115 (2000). See generally *In re* MTS and WATS Market Structure, 97 F.C.C.2d 682 (1983) (First Reconsideration Order); *In re* MTS and WATS Market Structure, 97 F.C.C.2d 834 (1984) (Second Reconsideration Order). This charge was designed to compensate the LEC, at least partially, for the loss of regular access charges that would have applied if the call were handled as a regular long-distance call. COBAK should reduce this problem just as it reduces the problem of IP telephony arbitrage discussed in the text.

distance charges, the calling party, in making a long-distance call, effectively (if indirectly) pays his LEC for the local facilities used on a per-minute basis. In contrast to the access regime, customers in most parts of the country can purchase unlimited local calling using the same facilities on a flat-rated basis (with no per-minute charge for originating local calls).

These rules create an arbitrage opportunity for providers of IP telephony services that is likely to become significant as the quality of IP telephony improves.⁶⁸ In particular, through the enhanced services exemption, the IP telephony provider generally does not have to pay originating access charges to the calling party's LEC. Thus, if a customer can reach its ISP by dialing a local call, it can use an IP telephony provider to make long-distance calls and avoid originating (and possibly terminating) access charges. This arbitrage opportunity arises because, for long-distance calls, the calling party pays local access on a per-minute basis, while, for local calls, the calling party typically pays for the same access on a flat-rated basis.

This opportunity for regulatory arbitrage is exacerbated if the ISP is a customer of another LEC. In that case, when the calling party makes a long-distance call using IP telephony, not only does the calling party's LEC *not* receive originating access charges, it must also pay a termination charge to the ISP's LEC.

COBAK eliminates this disparate treatment of local versus long-distance calls by requiring the calling party's LEC, in both cases, to recover its local access and transport costs from its end-user customer. Moreover, under COBAK, neither the IXC nor the ISP's LEC can charge the calling party's LEC for termination. Thus, COBAK eliminates any non-economic regulation-induced incentive to choose an IP telephony provider over a traditional IXC because customers would face the same cost recovery mechanism for local access. Under COBAK, therefore, any differences between the cost of a long-distance call provided by a traditional IXC and a call provided by an IP telephony provider, would be based on the relative efficiencies of the carrier's networks and operations; this efficiency distinction (along with the quality of service provided) is precisely the criterion on which a customer should choose a carrier.

⁶⁸ It appears that the current inferior quality of IP telephony, compared with circuit-switched long-distance service, combined with reductions in per-minute access charges, has somewhat limited the shift to IP telephony in the United States. Expected quality improvements in IP telephony are likely to accelerate the erosion of access revenues in the future, however.

2. ISP Reciprocal Compensation Problem

A second source of regulatory arbitrage arises from the fact that, under the Commission's existing rules, the calling party's LEC generally must pay termination charges for local traffic terminating on another LEC's network,⁶⁹ and these termination charges generally are above-cost or inefficiently structured. Because of this situation, certain CLECs have targeted customers that primarily receive calls (ISPs and other entities) in order to generate unbalanced traffic flows and thus collect termination revenues from ILECs. This problem is frequently referred to as the "ISP reciprocal compensation problem," and is exacerbated by the fact that, given the prevalence of flat-rated local service, ILECs generally are unable to recover their termination costs from their customers who cause them.

Another problem, closely related to the ISP reciprocal compensation problem, is that of "one-way" networks. Under the existing reciprocal compensation regime, a business that primarily receives calls has an incentive to claim to be a network. Instead of purchasing business lines from a LEC, such a business has an incentive to install a switch and claim to be a network in order to collect termination charges for all the calls it receives. Although both problems involve the self-serving use of termination charges, the ISP reciprocal compensation problem concerns the incentives of carriers to seek customers that primarily receive traffic, whereas the one-way network problem gives a business the incentive to claim carrier (rather than customer) status in order to avoid having to pay for a business line.

By eliminating termination charges, COBAK significantly reduces these problems. Under COBAK, carriers will not be able to earn large profits by targeting customers that receive more minutes of traffic than they originate. Admittedly, COBAK will not completely eliminate the incentive of a business that primarily receives calls to claim to be a network. Because COBAK requires the calling party's network to deliver the call to the central office (or switch) of the called party, a business that primarily receives calls may still claim to be a network so that the calling parties' LECs will have to transport calls without charge to the business's switch. Under that scenario, the business may be able to avoid having to pay a retail end-user rate for a business line. It should be noted that such incentives are also present today under the existing interconnection regime.

69 See Local Competition First Report and Order, *supra* note 20, ¶¶ 1027-1118, at 16,008-58.

3. Inefficient Facilities Investment Resulting from Regulatory Arbitrage

Aside from causing significant rent transfers between carriers, the arbitrage opportunities discussed above can also create incentives for carriers to invest inefficiently. In particular, carriers may have an incentive to invest, or not to invest, in a particular technology because of the favorable regulatory treatment the technology receives, rather than because it minimizes the cost of providing service.

For example, an ISP that serves a customer on another carrier's network using dial-up service generates termination charges for each minute that the customer uses the service. However, the same customer would not generate such termination revenue if he were to connect to the ISP using digital subscriber line ("DSL") service. Thus, the existence of termination charges creates a disincentive for ISPs to upgrade their customers from dial-up service to more efficient high-speed DSL service.

Similarly, since termination rates allow a carrier to recover traffic sensitive costs only, carriers have the incentive to favor those technologies with higher traffic sensitive costs, rather than those with lower or no traffic sensitive costs. For example, suppose a fixed wireless access to the home provided the same functionality as the traditional wire loop. Suppose further that carriers could collect termination charges for fixed wireless loops, but not for wired loops. Carriers could then have an incentive to adopt the fixed wireless technology even if it were more costly than the traditional wired technology, as long as the termination revenue generated would exceed the additional cost of the wireless technology.

The one-way network problem generates similar incentives to invest inefficiently. Specifically, under the reciprocal compensation regimes adopted by the vast majority of states, networks that primarily receive calls are entitled to charge for termination, while business customers that primarily receive calls must pay a carrier for business lines. As previously noted, this dichotomy creates an incentive for a business that primarily receives calls to purchase a switch, self-provide dial tone, and claim to be a network in order to charge termination fees for all the calls it receives.

In addition, to the extent that the customer that chooses a set of services is the primary beneficiary, requiring her to bear the costs of that choice (by requiring their LEC to recover termination costs from the customer) will lead to an efficient choice. For example, if a customer enjoys the benefit of high-speed Internet access, then it would be efficient for that customer to bear the additional cost of this high-speed access, because she would choose to purchase the service when the benefits of high-speed access outweighed the cost. Similarly, if the primary beneficiary of mobile access (relative to wireline access) is the customer

purchasing service, then she is in the best position to weigh the costs and benefits of choosing wireless access.

COBAK reduces these incentive problems in at least two ways. First, COBAK is technology neutral; it applies the same rules regardless of the technology a carrier uses. This reduces the likelihood that a carrier will choose a less efficient technology solely because it receives more favorable regulatory treatment. Thus, COBAK gives carriers the incentive to use the technology that provides services at the least cost. Second, by eliminating per-minute termination charges, COBAK eliminates any incentives for carriers to invest inefficiently arising from the ISP reciprocal compensation problem and the one-way-network problem. However, as noted above,⁷⁰ COBAK does not solve all incentive problems.

B. *Monopoly Power over Terminating Access*

The current requirement that carriers pay the called party's network to terminate calls confers monopoly power on the called party's network with respect to terminating access. This market power arises from the fact that the calling party's carrier, whether a local carrier or an IXC, has no alternative carrier that can terminate a call to a particular party. Thus, the calling party's carrier must pay the terminating network whatever price it demands in order to reach the called party. In effect, each terminating carrier, no matter how small, has a monopoly over termination to its own customers. Recently, in fact, IXCs have begun to complain that certain CLECs have exploited their monopoly power in termination by setting access charges that far exceed those charged by major ILECs.⁷¹

This problem presents regulators with the unattractive choice of allowing non-incumbent carriers to exercise their terminating market power, which could raise retail prices and reduce network usage, or regulating the terminating access rates of all carriers, even those that would not possess market power under alternative interconnection regimes.⁷² COBAK eliminates this problem because it causes LECs to recover termination costs from its own end users. To the extent that a carrier faces competition from other carriers for end users, it will not have monopoly power over termination, since any attempt to charge above-cost

70 See *supra* Subsection III.A.2.

71 See, e.g., Pricing Flexibility Order and NPRM, *supra* note 32, ¶ 186, at 14,316-17 (discussing AT&T's petition for declaratory ruling that complained of excessive CLEC access charges).

72 *Id.* ¶¶ 180-89, at 14,312-20; see also LAFFONT & TIROLE, *supra* note 14, at 186 (discussing the "common fallacy" that small players do not have market power and should therefore face no constraint on their termination charges). In fact, carriers with smaller market shares may have a greater incentive to charge excessive terminating access charges because those charges are not likely to be flowed through to interconnecting carriers' end-user prices. See *id.*

rates is likely to cause it to lose customers to competing carriers. In the case where there is no competition for end users, the ILEC's local rates would be regulated, as they traditionally have been, and the issue of how to recover local access costs would simply be folded into the rest of the local rate regulation process. Thus, COBAK eliminates the need for regulators to set termination prices.

C. *The Need for Regulatory Intervention*

An additional problem with the existing CPNP regime is that it requires regulators to intervene in the interconnection process on an on-going basis. First, because current interconnection rates depend on the type of traffic (i.e., interstate or intrastate), regulators are required to determine into what category each type of traffic falls. A good example of the difficulty of this type of intervention is seen in the debate regarding whether dial-up Internet traffic is jurisdictionally interstate or intrastate.⁷³

In addition, regulators are required to set both the level and structure of interconnection rates on an on-going basis. This is a difficult task for a regulator, made even more so by the fact that ILECs possess the relevant information but have disincentives to fully disclose it. As previously discussed, ILECs have an incentive, at least in the case of access charges, to report as high a cost (whether historical or forward-looking) as possible for their regulated services. For example, where the termination rate is based on the cost of switching, ILECs may have an incentive to overstate both their direct costs of switching as well as the overhead allocated to it. Setting reciprocal compensation rates (rates for two-way access) raises related issues.

It is also extremely difficult for regulators to set an efficient rate structure. Economists have long recognized that the most efficient way to recover the cost of "congestible" or "traffic-sensitive" shared facilities, such as switches and transport trunks, is to adopt peak-load pricing.⁷⁴ Unfortunately, because of the practical difficulties in determining peak-load prices,⁷⁵ regulators, including the Commission, have instead tended to

73 See *In re* Implementation of the Local Competition Provision of the Telecommunications Act of 1996; Intercarrier Compensation for ISP-Bound Traffic, 16 F.C.C.R. 9151 (2001) (Order on Remand and Report and Order) (finding that dial up traffic is jurisdictionally interstate). See also *Bell Atl. Tel. Cos. v. FCC*, 206 F.3d 1 (D.C. Cir. 2000) (remanding this decision back to the FCC for further consideration).

74 See, e.g., Local Competition First Report and Order, *supra* note 20, ¶ 755, at 15,878 ("[A]s a matter of economic theory, . . . if usage-sensitive rates are used, then somewhat higher rates should apply to peak period traffic, with lower rates for non-peak usage. The peak load price would be designed to recover at least the cost of the incremental network capacity added to carry peak period traffic."). See also KAHN, *supra* note 58, at 89-103.

75 In the Local Competition Proceeding, the Commission described some of the practical difficulties associated with peak-load pricing, including the fact that different geographic areas (such

adopt per-minute pricing that attempts to recover the average cost of the congestible facility.⁷⁶ This means, however, that prices will be too high during off-peak periods and too low during peak periods. In addition, in order to obtain higher termination rates, carriers have an incentive to overstate their termination costs to regulators in both the case of one-way access and where the regulator sets individual termination rates for each carrier based on that carrier's costs.

COBAK eliminates both the need for regulators to set termination rates and the incentive of a carrier to overstate its termination costs. Since under COBAK carriers will recover the cost of local access from end users, it allows the competitive market to discipline the way that LECs recover local access costs. Once competition develops, if a carrier sets prices in excess of its cost of serving a customer, a competing carrier is likely to lure the customer away by charging a lower price that better reflects the true cost. Similarly, if a carrier adopts an inefficient rate structure, it likewise risks losing customers to carriers that have adopted an efficient rate structure.

D. *Retail Rate Inefficiencies Caused by Interconnection Rates*

The existing interconnection regimes, particularly CPNP, tend to result in inefficient retail rates. Such inefficient retail rates can result in inefficient usage of the network and distort customer choices among competing local carriers.

One source of inefficiency is that existing termination charges create an "artificial" per-minute cost structure for carriers that will tend to result in inefficient per-minute retail prices. In unregulated competitive markets, such as the markets for CMRS services and Internet access services, retail pricing is moving away from per-minute charges and towards flat charges or two-part tariffs that guarantee a certain number of free minutes. This suggests that few costs are incurred on a per-minute basis, and that flat-rated pricing will lead to more efficient usage of the network. The existing reciprocal compensation scheme, which requires the calling party's network to pay usage-sensitive termination charges to the called party's network, imposes an artificial per-minute cost structure on carriers which, if retail rates are unregulated, will likely be passed through to customers in

as downtown business areas compared with suburban residential areas) could experience peak volumes at different times, that such peak periods could shift over time (e.g., due to increasing Internet usage), and that peak load pricing could cause peak period traffic to shift to off-peak periods. *See* Local Competition First Report and Order, *supra* note 20, ¶ 756 at 15,878. *See also* LEC-CMRS Interconnection NPRM, 11 F.C.C.R. 5020, ¶¶ 44-45, at 5041-42 (1996) (discussing practical difficulties in setting peak-load interconnection rates).

⁷⁶ *See, e.g.*, Local Competition First Report and Order, *supra* note 20, ¶¶ 756-57, at 15,878-79 (declining to require states to impose peak-load reciprocal compensation rates).

the form of per-minute retail rates. Such usage-sensitive rates thus would likely reduce usage of the network below efficient levels.⁷⁷

COBAK solves this problem by eliminating per-minute termination charges, which in turn eliminates the artificial per-minute marginal cost of calling. In other words, COBAK eliminates any artificial usage-based costs that result from regulation. To the extent that retail rates are unregulated (for at least some carriers), this should lead to more efficient retail rates.

A second inefficiency caused by inter-carrier termination charges is that they create an artificial cost difference between on-net and off-net calls.⁷⁸ Specifically, termination charges will cause carriers to have a higher effective cost for completing off-net calls than on-net calls.⁷⁹ This cost differential will lead to several types of inefficient behavior.

If retail rates are not regulated, then this cost difference will tend to cause carriers to charge a higher price for off-net calls than for on-net calls. This, in turn, will create an incentive for customers to choose their network based, at least in part, on the customers that currently subscribe to the particular network, rather than on the basis of which network most efficiently meets their needs. This network externality will not only cause some customers to choose a network that they otherwise might not, but it could also increase the tendency of telecommunications markets to tip into monopoly, as larger networks will have a relative advantage in attracting new customers.⁸⁰

77 The ISP market illustrates the importance of rate structure on usage. When AOL changed from usage sensitive rates to a flat charge for unlimited usage in late 1996, the number of customers and the usage per customer rose dramatically, and other competitors soon followed. See Kevin Coughlin, *AOL Logs on to Profits—Added Gear Revives Online Giant*, THE STAR LEDGER, May 18, 1997, at 1; Phil Waga, *AOL Smooths Out Problems, Readies New Features*, GANNET NEWS SERVICE, June 5, 1997. In addition, many believe that the main reason that Internet usage and penetration is lower in Europe than in the United States is because local service is priced on a traffic-sensitive basis in Europe, while it tends to be priced on a flat-rate basis in the United States. As a result, European regulators are considering how to offer flat-rate Internet access services. See, e.g., OFFICE OF TELECOMMUNICATIONS, DETERMINATION OF A DISPUTE BETWEEN BT AND MCI WORLDCOM CONCERNING THE PROVISION OF A FLAT RATE INTERNET ACCESS CALL ORIGINATION PRODUCT (FRIACO) (2000), available at <http://www.offtel.gov.uk/publications/pricing/ntsp0601.html> (requiring ILECs in the UK to offer flat-rated option to competitive ISPs); *Regulators Tell DT To Offer ISPs Flat-Rate Connections*, TELECOMMUNICATIONS REPS., Nov. 20, 2000, at 23 (reporting that the German regulator requires ILECs to offer a flat-rated option to competitive ISPs). Similarly, the introduction by CMRS providers in the United States of pricing plans that include “buckets” of minutes appear to have contributed significantly to the growth in wireless usage.

78 On-net calls are calls between customers that subscribe to the same network, and off-net calls are calls between customers that subscribe to different networks.

79 More precisely, assuming that the LEC has the same average transport costs for on-net and off-net calls, the carrier can recover the transport cost of an on-net call from both parties to the call, whereas, in the case of an off-net call, it must recover the entire transport cost from the calling party.

80 See DeGraba, *supra* note 10.

If, on the other hand, retail rates are regulated, inter-carrier termination fees will cause a different type of inefficiency. In particular, if regulations require that termination costs be recovered from all customers equally, then CPNP termination will force a carrier's customers that do not make off-net calls to contribute to the cost of the facilities of other networks and subsidize the carrier's customers that do make off-net calls.⁸¹

Again, COBAK substantially solves this problem, regardless of whether retail rates are regulated. By eliminating inter-carrier termination charges, COBAK eliminates any artificial cost differential between off-net and on-net calls.⁸² This, in turn, will reduce the incentive of non-rate-regulated LECs to charge different prices for off-net and on-net calls.⁸³ In the case of rate-regulated carriers, on the other hand, COBAK will reduce the ability of one carrier to impose its network costs on another carrier's customers.

A final possible inefficiency of the existing interconnection regime is that the inter-carrier interconnection charges may be used to facilitate oligopolistic collusion. More specifically, competing local networks may agree on above-cost interconnection charges in order to justify higher end-user prices.⁸⁴ Again, COBAK solves this problem by eliminating per-minute termination charges. Thus, under COBAK, carriers have no ability to collude by agreeing on above-cost interconnection charges.

V. Implementation Issues for COBAK

While COBAK eliminates the need for regulators to set termination rates for each interconnecting network, it does raise several implementation issues, which would have to be resolved before COBAK could be adopted. These are discussed below.

81 For example, suppose that there are two networks—an ILEC network and a CLEC's network. Suppose further that the CLEC's only customer is an ISP that only receives calls from the ILEC's network. In this case, if the termination charge for the CLEC's network equals the per-minute cost of its switch, then the CLEC network would recover the entire cost of the switch through termination charges. Thus, customers of the ILEC's network will pay for the entire cost of the CLEC's switch.

82 COBAK will not completely eliminate the cost differential between on-net and off-net calls, however. In the case of an on-net call, the carrier can split the cost of transport between the calling and called parties. In the case of an off-net call, however, the calling party's carrier, which bears the entire cost of transport, can only recover that cost from its own end-user customer. Thus, if the COBAK default is employed, the calling party's carrier is likely to view an off-net call as somewhat more expensive than an on-net call. If, as appears likely, however, carriers negotiate a meet-point arrangement in which they split the transport costs, it should reduce any cost differential.

83 Of course, a carrier may still choose to offer different rates for off-net and on-net calls as a marketing device. In a competitive market, however, such pricing would tend to survive only if it were efficient. The important point is that such rates would not be induced by the regulatory regime.

84 LAFFONT & TIROLE, *supra* note 14, at 190-95.

A. *Identifying Central Offices*

As discussed, Rule 2 makes the calling party's carrier responsible for the cost of transporting the call to the called party's central office. This raises two separate implementation issues concerning the location of central offices. First, to the extent that there is any uncertainty concerning which facilities qualify as a central office, this rule will give networks an incentive to claim that their central offices are as close to the end-user customer as possible. Second, this rule may cause networks to locate their central offices inefficiently. These issues are discussed in this and the next Sections.

To illustrate the first issue, consider a traditional wireline carrier that employs digital-loop-carrier ("DLC") technology.⁸⁵ The DLC electronics typically are installed in remote terminals ("RT") located somewhere between the central office and the customers' premises. All else being equal, such a carrier would rather have an RT declared a central office than the switch to which it is connected. Although this issue is not likely to prove a significant problem for existing network technologies, it could prove a problem as new technologies are developed and deployed.

It thus appears reasonable to adopt rules defining those points in a given network that qualify as central offices for the purposes of COBAK. One approach would be to define the central office or local switch in terms of certain observable attributes. For example, one could define the central office as the node at which loops (1) are aggregated and (2) gain access to the transport network. The definition, of course, raises the question of what it means to "gain access to the transport network."

A second approach would be to define a central office as a node that interconnects and exchanges traffic with other equivalent nodes. Under this definition, remote terminals would not be considered central offices because they do not exchange traffic with other remote terminals. Rather, remote terminals aggregate traffic for the purpose of carrying it to the central office, which provides local switching. Alternatively (or additionally), one might define a central office as a node at which other networks can interconnect.

An alternative approach would be to specify that, in order to qualify as a central office, a node must connect a minimum number of customers

85 "In a [digital-loop-carrier] system, analog signals are carried from the customer's premises to a remote terminal (RT), at which they are converted to digital information, multiplexed with other signals, and transported, generally through fiber facilities, to the LEC central office." *In re* Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, 14 F.C.C.R. 20,912, ¶ 69 n.152, at 20,945-46 (1999) (Third and Fourth Report and Order) [hereinafter Line Sharing Order].

(for example, 50,000). A similar approach would be to declare that any node within a specified distance of the called party (for example fifteen miles) could be treated as the central office for purposes of COBAK.

Despite the abstract difficulties in defining the local central office, this does not appear to present an insurmountable problem in practice. First, as previously mentioned, there appears to be general agreement as to what constitutes a central office for today's wireline technology.⁸⁶ Second, it appears likely that networks will generally negotiate one or more meet points for exchanging traffic on a bill-and-keep basis, particularly where each network both originates and terminates traffic. In these cases there will then be no need to identify central offices.

B. *The Problem of Remotely Located Central Offices*

Another implementation issue involving central offices is the determination of who should bear the cost of transport where the called party's network locates its central office switch in a remote location, such as outside local calling areas.⁸⁷ This is important because a network bearing a small portion of the cost of transport may have an incentive to design its network inefficiently with too few switches or locate switches in places that will not minimize the overall cost of the network. In this regard, this problem is likely to be significantly greater where the called party's network only receives traffic. Thus, for example, if both parties to a call live within the same local calling area, but the switch serving the called party is located in another state, should the calling party's network be forced to bear the cost of transporting the call to the called party's switch?⁸⁸

One way to deal with this problem, at least for ILECs subject to retail rate regulation, would be through adjustments in retail end-user rates (CLECs clearly could implement this solution on their own). A regulator might allow the ILEC to impose toll charges whenever its customers call customers served by remotely located central offices. To the extent that calling parties then complain to customers of the network with the distant

⁸⁶ Similarly, most would agree that the mobile telephone switching office ("MTSO") should qualify as the central office for a wireless network.

⁸⁷ This issue is a specific manifestation of the more general problem of whether COBAK, or any alternative interconnection regime, creates incentives for networks to deploy the efficient number of switches and to locate them efficiently. For example, one might also ask whether a particular regime creates appropriate incentives for carriers to choose the efficient number of central office and tandem switches to include in its network. While the more general question is beyond the scope of this Article, it appears that COBAK is likely to create fewer incentives to engage in inefficient investment than the current CPNP regime, for it eliminates inter-carrier termination payments.

⁸⁸ A similar problem arises in wireless networks, where a single MTSO may serve a very large geographic area. In that case, the question becomes whether wireline networks should be responsible for building transport facilities to the wireless network's MTSO.

central office, those customers might consider changing carriers so that friends and neighbors could call them without incurring toll charges. This potential loss of customers might thus induce the network with the remote central office to negotiate points of interconnection within a local calling area and to bear the cost of such “remote transport” itself. On the other hand, this solution may not be effective if the calling parties do not complain to the called party or if the called party does not care about the toll charges others may pay.

A second approach would be to require the network with a remotely located switch to provide points of interconnection within a local calling area. Under this approach, each such point of interconnection would be treated as the called party’s central office when the network with the remote switch receives calls from another network. This is similar to the practice of wireless carriers of establishing points of interconnection in local calling areas in order to avoid having calls to their network classified as toll calls.

Two final points are worth noting. First, as previously mentioned, this problem of remotely located central offices is likely to be particularly acute for networks that primarily or exclusively terminate traffic. Because, under COBAK, such “receive-only” networks are not responsible for the cost of transporting traffic they receive from other networks, they would have no incentive to locate their central offices in a manner that minimizes the total cost of building transport facilities. The two approaches suggested above should mitigate these problems, however. For example, a paging company may have difficulty attracting customers if parties seeking to page those customers must incur a toll charge. Second, although COBAK does not completely eliminate incentives of carriers to locate central offices inefficiently, it certainly does not exacerbate the problem as compared with the existing CPNP interconnection regime. This is due to the fact that the calling party’s network is responsible for the entire cost of transport under the current CPNP regime, just as it would be under COBAK.

C. Distinguishing Between Carriers and End-User Customers

A third implementation issue is whether COBAK, or any other interconnection regime, creates incentives for end-user customers to claim to be an interconnecting network. This “sham network” problem clearly exists under the current interconnection regime. Specifically, a business today, particularly if it primarily or exclusively receives calls,⁸⁹ may have

⁸⁹ ISPs are one example of entities that have an incentive to establish themselves as a separate network in order to collect termination charges. COBAK eliminates such an entity’s ability to collect termination charges.

an incentive to claim to be a network instead of an end-user customer in order to (1) receive reciprocal compensation payments and (2) avoid paying business line rates to be connected to the incumbent's network.⁹⁰ Thus, for example, although the Commission, in the *Local Competition Order*, concluded that paging companies were local exchange carriers entitled to reciprocal compensation under § 251(b)(5),⁹¹ ILECs have argued that they should not be required to transport calls or pay reciprocal compensation to paging companies.⁹²

COBAK significantly reduces this “sham network” problem. Specifically, by eliminating termination charges, COBAK eliminates the possibility that the interconnection regime could become a “money pump” for a business claiming to be a network.

COBAK does not entirely eliminate the incentive for a business that only receives calls to claim to be a network, however. In particular, if such a business can qualify as an interconnecting network, then the originating network will be responsible for the cost of transport to that business's switch, and the business can avoid having to pay a subscription fee (i.e., purchase business service from the interconnecting carrier). For this reason, it seems reasonable to require some showing that the business claiming to be a network exhibits genuine characteristics of a network, such as ownership of a switch.

Whether COBAK's inability to solve completely this “sham network” problem will pose a significant problem in practice is unclear. It may be that the costs of qualifying as a network, such as purchasing a switch or interconnecting with the incumbent's signaling system, would be sufficiently high so as to render this problem a mere curiosity. What is clear, however, is that COBAK reduces the problem significantly compared to the incentives that exist under current CPNP regimes.

D. *Accounting for “Unwanted” Calls*

Much of the analysis of this Article assumes that the called party benefits from received calls and therefore should share in the cost of such calls. To the extent that implementation of COBAK results in the assessment of per-call or per-minute charges on the called party, the issue arises as to how to protect called parties from being charged for unwanted calls, such as calls from a telemarketer received during dinner. Note that

90 In addition, an entity may claim to be a network in order to qualify to lease unbundled network elements from an ILEC. *See* 47 U.S.C. § 251(c)(3) (Supp. IV 1998) (requiring an ILEC to offer nondiscriminatory access to network elements on an unbundled basis to “any requesting telecommunications carrier”).

91 Local Competition First Report and Order, *supra* note 20, ¶ 1008, at 15,997.

92 *See, e.g.*, TSR Wireless, LLC v. U.S. West Communications, 15 F.C.C.R. 11,166 (2000) (Memorandum Opinion and Order).

this would not be a problem if the called party's carrier decided to recover local access costs through flat charges rather than per-minute or per-call charges. If, as suggested above, competition will tend to generate flat-rated end-user charges, rather than per-minute or per-call charges, this problem accordingly will not arise.

Even if there are per-minute end-user rates, unwanted calls do not appear to pose a significant problem, provided that the called party actually answers the phone and participates in the call. In this case, if the called party does not want to talk to the calling party, he can simply hang up, thus avoiding continuing termination charges. This should significantly limit the amount of per-minute charges for which the called party may be liable. Alternatively, carriers could agree (or could be required) not to charge their customers for the first minute of a received call. This "free first incoming minute" would give called parties the opportunity to identify the calling party and decide whether they wish to continue the call.⁹³ Finally, parties, using caller-ID or similar devices, could screen their calls to avoid incurring unwanted termination charges.

This issue could prove a bit more problematic for calls where the called party does not actually answer the phone. For example, if the calling party left a message on an answering machine or delivered an unsolicited fax, then the called party might be charged for termination without affirmatively accepting the charges. In addition, it is possible that parties may receive large unsolicited e-mails that, when downloaded, could tie up a telephone circuit for several minutes. Although it is not clear how significant a problem this may become, the last example suggests that it may become necessary or advisable to develop the technical capability to stop the transmission of large data files beyond the local central office until the called party affirmatively approves the download.⁹⁴

E. *Determining Transport Rates*

While COBAK makes the calling party's carrier responsible for the cost of transporting the call to the called party's local central office, it does not specify how the calling party's carrier should arrange for the transport of the call. Thus, while some carriers may construct their own transport network, others may lease transport facilities from other parties, including the ILEC. The issue then arises whether regulators need to constrain in some way the lease rates charged for such transport facilities.

⁹³ Many wireless companies offer this service today.

⁹⁴ In fact, certain ISPs currently do just this when they merely notify customers that an e-mail has been received but do not transmit it until the customer affirmatively opens the message.

If there are a sufficient number of alternative providers of transport facilities, regulation should be unnecessary, for competition will drive the price of transport towards economic cost. If, however, the only provider of transport facilities is the ILEC, then there is cause for concern because the ILEC may have an incentive to charge high prices for transport in order to deter entry of competitive carriers. In such a case, it would be necessary to regulate the price that ILECs charge for transport facilities, at least until competition renders such regulation unnecessary.⁹⁵ Such regulation already exists since ILECs are required to offer shared transport as an unbundled network element.

F. *End-User Charges*

That COBAK eliminates most existing inter-carrier charges and instead causes carriers to recover those costs from their end users raises the general issue of whether it is necessary or appropriate to regulate the way in which carriers recover those costs from their end users. In particular, it raises the following two questions: First, under what conditions is it necessary to regulate the level or structure of end-user rates? Second, should LECs be allowed to charge end users different fees depending on whether the call terminates on or off the originating LEC's network? These questions are discussed briefly below.

1. ILEC End-User Charges

As previously explained, if COBAK were adopted, it would eliminate much of the revenue LECs currently receive from inter-carrier charges. Specifically, it would eliminate all originating access charges (both interstate and intrastate) and any terminating access charges that currently recover the cost of the loop and local switch. In addition, it would eliminate any revenues that LECs with unbalanced traffic receive from (or pay to) reciprocal compensation. Instead, under COBAK, LECs would recover the costs of these network facilities from their end users. The question then becomes whether it is necessary to regulate the charges the LECs impose on their end users or, alternatively, which carriers should be subject to such regulation.

⁹⁵ In the Local Competition Proceeding, the Commission identified transport facilities as a network element that must be provided to requesting carriers on an unbundled basis. *See* Local Competition First Report and Order, *supra* note 20, ¶¶ 428-51, at 15,714-22; Local Competition Third Report and Order, *supra* note 20, ¶¶ 319-80, at 3840-66. The Commission has also indicated, however, that it will relax or eliminate regulation of transport rates as competition develops. *See* Pricing Flexibility Order and NPRM, *supra* note 32, ¶ 45, at 14,243.

The answer to this question is clear and has already been adopted. It is the same answer that the Commission adopted when it opened the long-distance market to competition. Specifically, regulation of end-user rates is necessary and appropriate where a LEC is a dominant carrier (i.e., possesses individual market power) but unnecessary if a LEC is non-dominant (i.e., does not possess individual market power).⁹⁶ Thus, where the LEC already is regulated, it appears appropriate to extend rate regulation of ILECs to the recovery of these costs, while it appears unnecessary to regulate the rates of carriers whose end-user rates are not currently subject to regulation. Moreover, as competition develops and erodes the market power of ILECs, it should be possible to eliminate all regulation of end-user rates.

It is important to recognize that shifting the recovery of these costs from carriers to end users should not, on average, increase the total costs faced by end users. This is so because carriers that currently pay inter-carrier charges, like long-distance carriers, pass these costs on to end-user customers in the form of higher rates. Thus, although a customer may see an increase in the bill he receives from his LEC, he should on average see a corresponding decrease in other charges, such as lower charges from his long-distance carrier. Of course, to the extent that the existing interconnection regime (and the current geographic averaging requirement for long-distance carriers) involves implicit subsidies, a shift to COBAK may result in some shift in costs among specific groups of consumers, such as raising slightly the costs for customers in high-cost areas. Any undue burden, however, could be addressed through targeted universal service or other support.

Finally, although this Article does not attempt to address the legal issues associated with COBAK, it is worth noting that COBAK could be implemented through relatively uncomplicated rules. For example, the Commission, which has jurisdiction over interstate access charges, could adopt rules requiring that access charges currently assessed on IXCs instead be charged to the end user. Similarly, state commissions could transfer current intrastate access charges from IXCs to end users. Of course, it seems reasonable that both sets of regulators should reassess the rate structure of existing access charges before shifting them to end users.

2. Discriminatory End-User Rates

Regardless of the prevailing interconnection regime, a LEC may want to impose different end-user charges for different types of traffic. For example, while a LEC may offer unlimited calling within a specified

96 See Competitive Carrier First Report and Order, *supra* note 62.

geographic area for a flat monthly fee, it may wish to charge an additional fee when a customer calls a party outside that specified local calling area. Similarly, a LEC may want to charge a higher fee when a customer calls someone on another carrier's network. Finally, in order to encourage its customers to use its own interexchange affiliate or ISP, a LEC might want to charge a customer an additional fee if the customer subscribes to a competing IXC or ISP.⁹⁷

As a general matter, the issue of whether to permit discriminatory end-user charges is more of a competition or antitrust concern, rather than an interconnection concern per se. In other words, the real issue is whether specific instances of price discrimination constitute anti-competitive behavior, or whether they simply reflect an efficient method for recovering costs.⁹⁸

If the relevant telecommunications market is sufficiently competitive that there is no dominant carrier, then permitting differential charges is not likely to cause a problem. For example, a LEC that attempted to charge its customers a usage fee for connecting to a specific ISP when that fee was not cost-justified would likely find this strategy to be unprofitable. Specifically, if the market for telephone service were sufficiently competitive, competing carriers would offer equivalent interconnection at a lower charge and steal the LEC's customers. Thus, sufficient competition would make it unlikely that a single carrier could cause competitive harm or hurt consumers by charging an above-cost fee.

Permitting a dominant firm to price discriminate in this manner could have anti-competitive consequences. For example, if a dominant LEC offered a complementary service, such as Internet service, for free, while charging customers using a competing service provider, competitors could be disadvantaged. It is worth reiterating, however, that this is not an interconnection concern. This issue of the competitive effects of discriminatory end-user pricing arises regardless of the interconnection regime.

Although the issue of how to prevent the anti-competitive use of price discrimination is beyond the scope of this Article, it is worth noting that there are a number of different ways to address this problem. One simple

⁹⁷ For a detailed discussion of how an ILEC offering inter-exchange service and possessing market power in the provision of local exchange access can disadvantage competing IXCs whose customers purchase local service from the LEC, see *In re* Developing a Unified Inter-carrier Compensation Regime, F.C.C. Docket No. 01-132, attachment (Aug. 20, 2001) (Declaration of Patrick DeGraba).

⁹⁸ It should be noted that numerous examples of price discrimination can be found in competitive markets. For example, airlines typically charge significantly different prices for identical seats on the same or a similar flight, with the variation in price depending on such factors as how far in advance the customer books the flight, whether the passenger is staying over on a Saturday night, and whether the passenger is a member of the airline's frequent flyer club.

approach would be to provide interconnecting carriers the option of avoiding such discriminatory pricing. Specifically, if, for purposes of receiving calls, an interconnecting network agrees to bear all of the cost of transport between the central office of the calling party and that of the called party, then the calling party's network would not be able to charge its customers an additional fee for calling customers of the interconnecting network.

Finally, it is worth reiterating that this problem of anti-competitive price discrimination can arise regardless of the particular interconnection pricing regime. Nevertheless, as competition is introduced among networks, this problem surely will become more significant.

Conclusion

The existing patchwork of interconnection regimes has evolved over time in response to regulatory and service distinctions and a number of evolving policy goals. Unfortunately, existing interconnection regimes face increasing problems as telecommunications markets become competitive and as the Internet continues to experience explosive growth. These problems include various opportunities for regulatory arbitrage, the terminating monopoly access problem, the need for regulatory intervention, and inefficient retail rates and structures caused by inefficient interconnection prices. These growing problems call into question the continued viability of the existing system and highlight the need to develop a rational and uniform system of interconnection pricing that is technologically neutral and will allow the lifting of regulation as competition develops.

This Article proposes a unified approach to interconnection pricing, which would apply to all types of carriers that interconnect with, and to all types of traffic that pass over, the local circuit-switched network. The proposed approach should eliminate or significantly ameliorate the most significant problems afflicting current interconnection regimes. It should also encourage efficient use of networks by customers and efficient investment and deployment by carriers. Finally, it should reduce the need for regulatory intervention, both now and as competition develops in all telecommunications markets.