

Call Termination Fees: The U.S. in global perspective

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Abstract

The economic framework under which the United States implements call termination fees is unusual. Several recent studies suggest that the United States system has resulted in greater use of mobile telephony services and in lower cost to consumers than many other systems. This paper summarizes call termination fee mechanisms in the United States, maps them to established economic theory, and places them in comparative context for an international audience.

In the literature, there has been a tendency to ascribe differences in outcome solely to the use of a Mobile Party Pays regime (also known as a Receiving Party Pays regime). In this paper, we suggest that Mobile Party Pays is an important element, but that it needs to be understood in the context of other mechanisms that have had a complementary effect. Further, we argue that fixed and mobile termination rates need to be understood as a single integrated economic system.

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1. Introduction

The economic framework under which the United States implements call termination fees² is unusual. Several recent studies suggest that the United States system has resulted in greater per-customer usage of mobile telephony services, and in lower average per-minute prices to consumers, than many other systems.³ Our analysis supports these conclusions, but we do not believe that this is the end of the story.

Mobile termination rates have been a topic of intense debate in Europe in recent years. In the United States, termination rates are under challenge from a number of quarters. Technological and industry convergence, notably including IP telephony, is placing huge strains on the existing system. A reexamination of termination fee issues is timely.

Call termination fees tend not to be constrained by the competitive economic forces that constrain many other prices due to an effect (discussed later in this paper) known as the *terminating monopoly*. High and asymmetric call termination rates have raised concerns in Europe in recent years because they effectively force fixed users to provide large and arguably irrational subsidies to mobile users,⁴ and also because they are one of several factors that contribute to European mobile average prices per *minute of use (MoU)* that are about twice as high as comparable prices in the United States.⁵

In the literature, there has been a tendency to ascribe these differences in usage and in price per MoU solely to the use in the U.S. of a Mobile Party Pays regime (also known as a Receiving Party Pays regime). We reject this notion as simplistic. In this paper, we suggest that Mobile Party Pays is an important element, but that it needs to be understood in the context of other mechanisms that have had a complementary effect.

² For purposes of this paper, we consider call termination fees to represent payments that one operator makes to another to complete a call, including not only reciprocal compensation but also access charges (defined in the next section). We do not distinguish between termination and *transit* (from the customer's central office to the point where the operators interconnect). In one instance (access fees), we discuss payments to the originating carrier, even though it is something of an oxymoron to refer to a payment to the originating operator as a call termination fee.

³ Cf. Robert W. Crandall and J. Gregory Sidak, "Should Regulators Set Rates to Terminate Calls on Mobile Networks?" forthcoming in *Yale Journal on Regulation*, 2004. See also Stephen C. Littlechild, "Mobile Termination Charges: Calling Party Pays vs Receiving Party Pays", available at <http://www.econ.cam.ac.uk/dae/repec/cam/pdf/cwpe0426.pdf>. Finally, cf. FCC, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service*, WT docket no. 02-379, released July 14, 2003 (hereinafter the *8th CMRS Competition Report*).

⁴ The termination rates of the wired incumbent are typically limited by regulation to less than two eurocents per minute of use (European Commission, *Ninth report on the implementation of the EU electronic communications regulatory package* (hereinafter *9th Implementation Report*), COM(2003) 715 final, 19 November 2003), while European mobile termination rates average about 19 eurocents per minute of use (FCC, *8th CMRS Competition Report*). Thus, the subsidy flows from fixed operators to mobile operators.

⁵ FCC, *8th CMRS Competition Report*. We return to this point later in this paper.

Further, we argue that fixed and mobile termination rates need to be understood as a single integrated economic system. Fixed-to-fixed, fixed-to-mobile, mobile-to-fixed, and mobile-to-mobile call termination rates interact in complex ways.

In particular, we argue that the U.S. intercarrier compensation regime for local calls, which establishes a presumption that local termination rates will be symmetric and based on the forward-looking costs of the incumbent wireline operator (unless the interconnecting party chooses to document a higher cost structure) has contributed strongly to low termination rates. This tendency to symmetry and low rates has permeated the system, even where regulation does not impose it. The termination rates for local calls between wireless operators, and also between non-incumbent wireline operators, are unregulated and are usually zero (“bill and keep”).

The trend toward zero marginal *cost* for domestic U.S. calls has in turn fostered a migration to zero marginal retail *price*. Starting in 1998, wireless operators began offering nationwide “buckets of minutes” plans with no roaming or long distance charges. More recently, we are seeing the same evolution among wireline telephony operators.

Finally, we do not mean the paper merely to be a chest-thumping endorsement of United States regulatory policy, nor do we wish to naively suggest that other countries should rush to emulate our example. Nevertheless, the U.S. system does appear to have generated better results in a number of respects – perhaps as much through dumb luck as through regulatory genius. In any case, it is clear that the entire intercarrier compensation system will continue to face significant challenges in all countries in the years to come, and that further evolution is essential everywhere.

In support of that evolution, this paper seeks to summarize call termination fee mechanisms in the United States. We do not attempt to develop new economic theory; rather, we seek to map call termination fee mechanisms in the U.S. to established economic theory, and to place them in comparative context for an international audience, particularly a European audience.

This section provides the framework for the discussion that is to follow. The next section describes existing call termination fee mechanisms in the United States, and seeks to map the U.S. system to results in the economic literature. The subsequent section establishes a global context and compares the effects of call termination fee mechanisms in the U.S. to those of other developed countries in terms of mobile penetration and the cost of mobile service. We then offer concluding observations about the long-term challenges to the termination fee system, and prospects for future global evolution in Europe and the U.S.

2. An Overview of Call Termination in the United States

This section introduces key definitions and concepts, in keeping with our goal of making the system understandable to an international audience. It then proceeds with a description of call termination fee arrangements in the U.S., concluding with a tabular summary of the various mechanisms in place. Economic background is provided where appropriate, notably in regard to the termination monopoly problem. The section concludes with a discussion of the causes and implications of symmetry in call termination fees.

2.1 Terminology and basic concepts

Call termination arrangements in the United States depend on the nature of the call placed, and on the categorization of the carriers originating and terminating the call, in complicated ways. In the interest of simplifying the presentation we intentionally ignore some of the fine detail of the system;⁶ unfortunately, it is impossible to fully grasp the system without mastering certain of its complexities.

Calls between two points in the same local calling area are *local calls*. Calls between two different areas are *long distance calls*. Carriers that provide local calling service over wired facilities are *local exchange carriers (LECs)*. Carriers that provide long distance service are *interexchange carriers (IXCs)*. Mobile operators provide *commercial mobile radio services (CMRS)*.

Reciprocal compensation is associated with local calls; *access charges* are associated with long distance calls.

The boundaries of local calling areas (LATAs) do not correspond to those of states; thus, long distance calls may be either interstate or intrastate.

Historically, local telephone service was provided by monopoly operators; these local monopoly providers of wired telephone service are *incumbent local exchange carriers (ILECs)*. In recent years, the market for local telephone service was opened to competition; the new entrants that compete with the ILECs in the provision of local calling service over wired facilities are *competitive local exchange carriers (CLECs)*.

An FCC order further explains:

“Existing intercarrier compensation rules may be categorized as follows: *access charge rules*, which govern the payments that interexchange carriers (“IXCs”) and CMRS carriers make to LECs to originate and terminate long-distance calls; and *reciprocal compensation rules*, which govern the compensation between telecommunications carriers for the transport and termination of local traffic. Such an organization is clearly an oversimplification, however, as both sets of rules are subject to various exceptions ...

The access charge rules can be further broken down into *interstate* access charge rules that are set by this Commission, and *intrastate* access charge rules that are set by state

⁶ For example, we ignore for the most part international calls, intrastate inter-LATA calls, and the Enhanced Service Provider exemption.

public utility commissions. Both the interstate and intrastate access charge rules establish charges that IXCs must pay to LECs when the LEC originates or terminates a call for an IXC, or transports a call to, or from, the IXC's point of presence ("POP"). CMRS carriers also pay access charges to LECs for CMRS-to-LEC traffic that is not considered local and hence not covered by the reciprocal compensation rules. ... These access charges may have different rate structures—i.e., they may be flat-rated or traffic-sensitive. In general, where a long-distance call passes through a LEC circuit switch, a per-minute charge is assessed. ..."⁷

Reciprocal compensation fees relate to local calls, and flow from the originating LEC to the terminating LEC (see Figure 1); access charges relate to long distance calls, and flow from the IXC to both the originating and terminating LECs (see Figure 2).

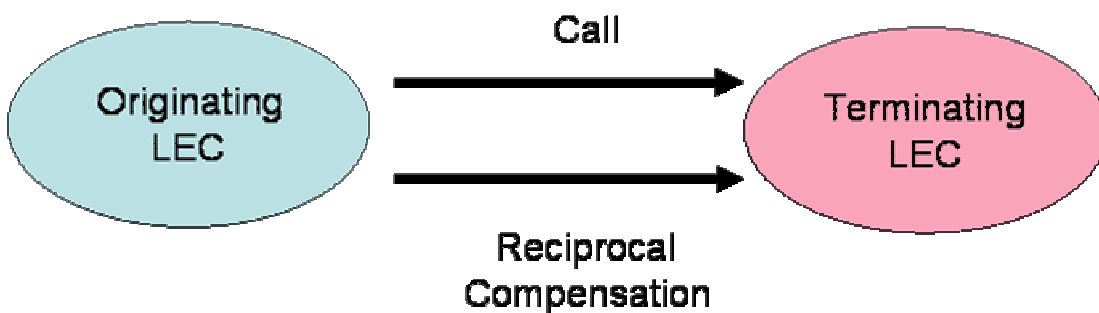


Figure 1. The flow of reciprocal compensation.

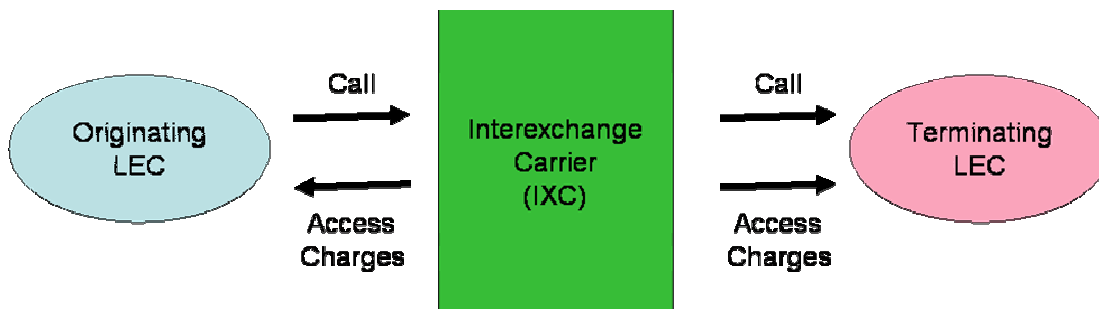


Figure 2. The flow of access charges.

In the discussion that follows, we will often refer to intercarrier compensation arrangements as *calling party's network pays (CPNP)*, which reflects the widely implemented practice whereby the calling party's network pays a call termination fee to

⁷ FCC, *In the Matter of developing a Unified Intercarrier Compensation Regime* (hereinafter *Unified Intercarrier Compensation NPRM*), CC Docket 01-92, released April 27, 2001, §§6-7.

the network that terminates the call (and in the case of long distance calls, also to the LEC that originates the call). The literature often refers to these same arrangements as *calling party pays (CPP)*, despite the fact that it is not really the calling party that pays. The fees of interest here flow between carriers, and do not necessarily correspond to retail payments by consumers.

The use of CPNP reflects the underlying assumption that the party that originates the call is the cost causer. This reflects in turn the underlying assumption that the originating party chooses to place the call, and is therefore willing to pay for the call, while the party that receives or terminates the call did not choose to receive it and is not necessarily willing to pay for the call. In recent years, many economists have called these assumptions into question. A recent paper by Jeon, Laffont and Tirole provides a detailed analysis.⁸

There is a tendency to speak of the U.S. as a *receiving party pays (RPP)* environment, or sometimes as *mobile party pays (MPP)* environment, in order to emphasize that it is not a CPNP environment. In fact, MPP and CPNP are not polar opposites. MPP refers to payments at the *retail* level. CPNP refers to intercarrier compensation in the form of call termination fees that flow from one carrier to another at the *wholesale* level.

The retail price of mobile services in the United States is unregulated. It is true that mobile operators generally account for minutes of use, whether for originating or for receiving calls,⁹ but this is a commercial practice that is independent of call termination fees.

An extensive literature exists on call termination. Laffont, Rey and Tirole are generally credited with the definitive analysis.¹⁰ A new paper by S.C. Littlechild¹¹ provides an extensive and thoughtful synthesis of the work on mobile termination to date.

⁸ Doh-Shin Jeon, Jean-Jacques Laffont, and Jean Tirole, “On the receiver pays principle”, to appear in the *RAND Journal of Economics*, 2004. They explore the inherent mirror-image relationship between calling and called party, and find that there is no qualitative difference, as “it takes two to tango.” See also Crandall and Sidak, *op. cit.*; Littlechild, *op. cit.* and FCC Working Paper 33, by Patrick DeGraba, “Bill and Keep at the Central Office As the Efficient Interconnection Regime”, available at <http://www.fcc.gov/osp/workingp.html>.

⁹ In many cases, mobile operators offer “buckets of minutes” plans where a consumer incurs no variable usage charges as long as usage is below an agreed quota of minutes; in this case, too, minutes of both origination and termination generally count against the quota, and are chargeable if they exceed the quota.

¹⁰ See Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications*, MIT Press, 2000. See also Jean-Jacques Laffont, Patrick Rey and Jean Tirole, “Network Competition: I. Overview and Nondiscriminatory Pricing” (1998a), *Rand Journal of Economics*, 29:1-37; and “Network Competition: II. Price Discrimination” (1998b), *Rand Journal of Economics*, 29:38-56. See also Crandall and Sidak, *op. cit.*; Littlechild, *op. cit.*; Michael Carter And Julian Wright, “Interconnection in Network Industries”, *Review of Industrial Organization* 14: 1–25, 1999; Julian Wright, “Access Pricing under Competition: An Application to Cellular Networks”, December 29, 2000; Doh-Shin Jeon, Jean-Jacques Laffont, and Jean Tirole, “On the receiver pays principle”, to appear in the *RAND Journal of Economics*, 2004; Chris Doyle and Jennifer C. Smith, “Market Structure In Mobile Telecoms: Qualified Indirect Access And The Receiver Pays Principle”, May 1999.

¹¹ Littlechild (2004), *op. cit.*

2.2 Reciprocal Compensation

Under the Communications Act¹², all LECs are required to establish reciprocal compensation arrangements for the transport and termination of telecommunications.¹³ The Act establishes a preference that reciprocal compensation be addressed through voluntary negotiations between the carriers.¹⁴

In the event that the parties cannot agree, they may ask the relevant state commission to mediate any dispute, or (where at least one party is an ILEC) they may petition the state commission to arbitrate any open issues. In the context of an arbitration, the state commission is to consider the terms and conditions that an ILEC proposes¹⁵ for such an agreement to be “just and reasonable” only to the extent that they result in the “mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier’s network facilities of calls that originate on the network facilities of the other carrier” based on a “reasonable approximation of the additional costs of terminating such calls.”¹⁶

Carriers may choose to offset obligations in order to achieve “mutual recovery of costs”, and are specifically permitted to waive mutual recovery altogether (e.g. to use “bill and keep” arrangements).¹⁷ In other words, they can agree not to charge one another.

Under the FCC’s implementing rules, when ILECs interconnect with non-dominant local carriers (be they wired or wireless) for the exchange of local traffic, the non-dominant carrier is presumed to have costs equivalent to those of the ILEC. This implies that reciprocal compensation rates will, by default, be symmetric. A non-dominant carrier retains the right to attempt to demonstrate underlying costs that are higher than those of the ILEC, but in practice this is rarely if ever done.

The combined effect of these provisions is that reciprocal compensation arrangements between an ILEC and any other wired or wireless carrier generally reflect either (1) the cost of the ILEC in both directions, or (2) no charges at all in either direction. In both cases, call termination fees are symmetric.

The FCC has summarized these arrangements in this way:

Section 251(b)(5) [of the Communications Act of 1934 as amended, as codified at 47 U.S.C.] imposes on all [Local Exchange Carriers (LECs)] a “duty to establish reciprocal compensation arrangements for the transport and termination of telecommunications.” Under current Commission rules interpreting the reciprocal compensation obligations of

¹² Communications Act of 1934 as amended, as codified at 47 U.S.C. (hereinafter *the Act*).

¹³ 47 U.S.C. §251(b)(5).

¹⁴ 47 U.S.C. §252.

¹⁵ 47 U.S.C. §252(d)(2)(A).

¹⁶ However, the rates are not necessarily the same as those TELRIC rates used to determine the price of Unbundled Network Elements (UNEs).

¹⁷ 47 U.S.C. §252(d).

incumbent LECs [ILECs], the calling party's LEC must compensate the called party's LEC for the additional costs associated with transporting the call from the carriers' interconnection point to the called party's end office, and for the additional costs of terminating the call to the called party. The Commission's rules further require that the charges for both transport and termination must be set at forward-looking economic costs. The Commission's rules permit a state public utility commission ("PUC") to impose a bill-and-keep arrangement, provided that the traffic exchanged between the interconnecting carriers is relatively balanced and neither party has rebutted the presumption of symmetric rates.

Existing access charge rules and the majority of existing reciprocal compensation agreements require the calling party's carrier, whether LEC, [interexchange carrier (IXC)] or [mobile], to compensate the called party's carrier for terminating the call. Hence, these interconnection regimes may be referred to as "calling-party's-network-pays" (or "CPNP"). Such CPNP arrangements, where the calling party's network pays to terminate a call, are clearly the dominant form of interconnection regulation in the United States and abroad. An alternative to such CPNP arrangements, however, is a "bill-and-keep" arrangement. Because there are no termination charges under a bill-and-keep arrangement, each carrier is required to recover the costs of termination (and origination) from its own end-user customers. As previously noted, under the Commission's rules, state PUCs may impose bill-and-keep arrangements on interconnection agreements involving an ILEC, provided that the traffic between the carriers is relatively balanced and neither carrier has rebutted the presumption of symmetrical rates. In addition, bill-and-keep arrangements are found in interconnection agreements between adjacent ILECs.¹⁸

It should be immediately apparent that:

- Reciprocal compensation termination fees between and ILEC and any other wireline or wireless carrier are on a Calling Party Network Pays (CPNP) basis. In this regard, they are not different from charges in most other countries. The rate of compensation is sometimes set to zero (bill-and-keep) by mutual agreement.
- Call termination fees are relevant at the wholesale level, but there is no regulatory requirement that they be flowed through to the retail level.
- ILECs are generally subject to retail rate regulation, at least for residential customers. The retail prices of other carriers (both mobile operators and wireline CLECs) are not regulated, so the degree to which retail prices reflect termination charges is a business decision, not a regulatory matter.
- For purposes of reciprocal compensation, mobile operators are generally treated no differently than competitive LECs (i.e. LECs that are not incumbent and thus presumed to be non-dominant).

¹⁸ FCC, *In the Matter of Developing a Unified Inter-carrier Compensation Regime* (hereinafter *Unified Inter-carrier Compensation NPRM*), §§8-9, CC Docket 01-92, Notice of Proposed Rulemaking adopted April 19, 2001.

2.3 The Terminating Monopoly

“So there I was, stranded with a broken down car in a one-horse town in Wisconsin with a gas station, a convenience store, and two barbers. I was on my way back from a two week fishing trip, and had to give an important talk in Chicago the next day. So what did I do? I did what any self-respecting, civilized man would do – I got a haircut!

But here’s the riddle. One barber looked pretty ragged, the other was well groomed. Naturally, I picked the one with the lousy haircut. And do you know why? I figured that he must have cut the hair of the barber who was well groomed! That was the man that I wanted – not the well-groomed barber, who presumably cut the hair of the barber who looked unkempt.”¹⁹

The workings of call termination fee arrangements can be counterintuitive.

Call termination fees generally flow from the calling party’s carrier to the receiving party’s carrier.²⁰ As previously noted, the caller is presumed to be the cost causer.

This CPNP system tends to create perverse economic incentives. Carriers tend to be motivated to set termination rates vastly in excess of real costs, because in doing so they raise, not their own costs, but rather the costs of their rivals. To the extent that these costs are reflected in retail prices, they are reflected in the prices of their competitors, and not in their own prices.

Once a consumer subscribes to the carrier’s service, that carrier controls a bottleneck that confers a degree of market power as regards calls that terminate to that customer. The market power arising from this bottleneck control is referred to as the *terminating monopoly*.

The market power arising from this bottleneck is exacerbated by the fact that, for a variety of practical and regulatory reasons, the consumer who places the call typically has at best limited visibility into the termination rates of the called party’s operator. Regulation (for instance, geographic averaging requirements) may prevent the originating operator from flowing the full termination charge back to the consumer.²¹ Users of pre-paid mobile service – which is rare in the U.S. but common elsewhere in the world – never see an itemized bill. The consumer may see only averaged call prices, or may not see individual call prices at all. For these reasons and others, the consumer who places the call typically lacks the economic signals that would enable him or her to seek to bypass high termination rates, and the consumer may have limited alternatives in any case.

The tendency toward above-cost termination rates is ultimately constrained by the price elasticity of demand. If a terminating operator increases its call termination rates, the increase may induce the firm’s competitors to increase their retail prices. The increased prices will tend to depress retail demand for outgoing calls from the firm’s competitors,

¹⁹ Derived from an old joke.

²⁰ By definition, call termination fees are for termination. Note that access charges can also flow to the *originating* LEC.

²¹ Cf. DeGraba, op. cit., page 8: “... 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.”

including calls to the operator that initiated the process by increasing its rates. Unfortunately, the equilibrium price in such a system is likely to be much higher than the actual call termination cost to the carrier that sets the high termination rate, and the equilibrium demand for calls to that carrier correspondingly lower than that which would exist absent the terminating monopoly.

Returning to our metaphor, we can now explain why the shaggy barber should be preferred. High termination rates do not directly raise costs to the customers of the operator that sets them; rather, *they tend to raise costs to those who place calls to that operator's customers*. They impact the prices of an operator's competitors, not those of the operator itself.

A recent paper by Haucap and Dewenter²² is particularly relevant. They study call termination rates in a CPNP system where the calling party has little or no visibility into termination fees (as is often the case for the reasons previously noted). They develop a mathematical model that provides two key insights into termination. First, they find that operators with a small number of customers tend to set termination rates *higher* than those with a large number of customers (because the rates that small carriers set have less impact on the average price paid by their competitors' customers). Second, they find that a regulatory "cap" solely on the termination rate of operators with market power in their respective home markets may serve to exacerbate, rather than to ameliorate, the problem of termination rates that greatly exceed costs.

Haucap and Dewenter use a regression analysis, based on termination rates of European carriers, to validate their model. They find a statistically significant negative correlation (in other words, a correlation in the predicted direction) between termination rate and number of subscribers. Interestingly, they find no significant correlation between termination rate and the HHI associated with the operator's home market. These findings are consistent with the notion an operator need not have Significant Market Power (SMP) in a retail market in order to be motivated to impose elevated termination costs; indeed, operators with high market shares will tend to be more constrained by the prospect of reducing the total call volume (due to demand elasticity to the extent that high call termination rates are reflected in retail prices).

2.4 Access charges and the terminating monopoly

With that theoretical background out of the way, we now return to call termination in the United States. High call termination rates have raised concerns in recent years in the mobile environment; however, the relevant economic models are not specific to the mobile market.

Recall that an IXC pays access charges to both the originating and the terminating LEC. Where the terminating LEC is a large ILEC, access charges are set in the range of

²² Dewenter, Ralf, and Haucap, Justus, "Mobile Termination with Asymmetric Networks", October 2003, available via SSRN. Presented at the 4th ZEW Conference on the Economics of Information and Communication Technologies, Mannheim, Germany, July 2004.

\$0.0055 to \$0.0065.²³ Slightly higher rates are permitted for certain smaller ILECs, including certain rural rate-of-return operators.²⁴

When the Telecommunications Act of 1996 opened local markets to competition, the FCC did not initially regulate the access charges that CLECs would assess on IXCs to originate and terminate calls. At the same time, because of statutory rate averaging requirements, IXCs were prohibited from charging different retail rates, even if access charges differed. As a result, numerous competitive local exchange carriers (CLECs) began to charge extremely high originating and terminating charges. In other words, these regulatory provisions had a net effect analogous to that studied by Haucap and Dewenter: they established a Calling Party's Network Pays system, they reinforced the terminating monopoly power of the CLEC, and they blocked customer visibility into the relevant pricing signals that might have enabled customers to respond.

In an order issued in 2001, the FCC summarized the problem as follows:

Despite previous indications that market forces might constrain CLEC access rates, the Commission recently found that, in actuality, the market for access services is not structured in a manner that allows competition to discipline rates. Specifically, the Commission found that the originating and terminating access markets consist of a series of bottleneck monopolies over access to each individual end user. Once an end user decides to take service from a particular LEC, that LEC controls an essential component of the wireline system that provides interexchange calls, and it becomes a bottleneck for IXCs wishing to complete calls to, or carry calls from, that end user. Thus, with respect to access to their own end users, CLECs have just as much market power as ILECs. In addition, the Commission determined that "the combination of the market's failure to constrain CLEC access rates, the Commission's geographic rate averaging rules for IXCs, the absence of effective limits on CLEC rates and the tariff system created an arbitrage opportunity for CLECs to charge unreasonable access rates." ... Because the CLEC access market is not truly competitive, we cannot simply assume that "whatever the market will bear" translates into a just and reasonable rate.²⁵

The magnitude of the disparity in termination costs was quite significant:

The access rates charged by ILECs operating in BTI's service areas are a relevant benchmark, because ILEC switched access services are functionally equivalent to CLEC switched access services. In addition, according to fundamental economic principles, in a properly functioning competitive market, the access rates of BTI's primary access competitors would have been a substantial factor in BTI's setting of its own access rates. Indeed, in other markets, BTI's pricing behavior adhered to these principles. BTI's rates for its local exchange service were approximately 15 to 25 percent below those of its primary competitors, BellSouth and GTE; and BTI's rates for long distance service were roughly the same as those of its primary IXC competitors.

²³ These provisions specifically apply to a class of large ILECs regulated pursuant to price caps. Smaller ILECs are generally regulated on a rate-of-return basis.

²⁴ FCC, "In the Matter of Access Charge Reform, Price Cap Performance Review for Local Exchange Carriers, Low-Volume Long-Distance Users, Federal-State Joint Board On Universal Service" ("CALLS Order"), CC Dockets 96-262, 94-1, 99-249, 96-45, released May 31, 2000.

²⁵ FCC, *In the Matters AT&T Corp., Complainant, versus Business Telecom, Inc., Defendant. Sprint Communications Company, L.P., Complainant, Business Telecom, Inc., Defendant*, Section III.B.1. Memorandum Opinion And Order, EB Docket EB-01-MD-001, Released: May 30, 2001.

Nevertheless, during all relevant times, BTI's access rate was significantly higher than the competing ILECs' rates. In July 2000, BTI's access rate of 7.1823 cents per minute was more than 15 times higher than BellSouth's average rate of approximately 0.48 cents per minute, and more than 7 times higher than GTE's average rate of approximately 1.0 cent per minute. In July 1999, BTI's access rate was more than 5 times higher than BellSouth's average rate of approximately 1.4 cents per minute, and more than 3.5 times higher than GTE's average rate of approximately 2.0 cents per minute. In July 1998, BTI's access rate was approximately 4.5 times higher than BellSouth's average rate of approximately 1.6 cents per minute, and more than 2.5 times higher than GTE's average rate of approximately 2.8 cents per minute.²⁶

The access charges that BTI, a CLEC, imposed on AT&T as recently as 2000 were thus in excess of 7 cents per minute, while charges that BellSouth imposed on AT&T in the same areas at the same were about a half cent per minute. The disparity is striking. The ratio is comparable to that between European mobile termination charges (about \$0.19 per minute of use)²⁷ versus European fixed termination rates (a bit less than \$0.02 per minute).²⁸ In both cases, the ratio is between a service with a termination monopoly and no regulatory constraint, on the one hand, and a regulated wireline incumbent operator on the other.

The cases are not strictly comparable – access charges are somewhat different from reciprocal compensation charges between local carriers. Recall that reciprocal compensation charges (see Figure 1) flow in either direction: When carrier A is the originating carrier, carrier A pays terminating local carrier B; when however A terminates a call originated by B, then B pays A. Access charges, however, are one-way charges – it is always the IXC that pays. The IXC pays both the originating local carrier and the terminating local carrier (see Figure 2).

The FCC found it necessary to regulate CLEC access charges by imposing a “cap”, based on the regulated access charges of the adjacent ILEC.²⁹ CLECs may unilaterally establish access charge rates by tariff as long as they are below the cap. If they wish to establish access charge rates above the cap, they must do so through voluntary negotiations.

There are some striking parallels between the reciprocal compensation rules and the access charge rules. First, it is the incumbent LEC that establishes the presumptive

²⁶ Ibid., section III.B.2.a.

²⁷ FCC, 8th CMRS competition report, 2003.

²⁸ European Commission, 9th implementation report.

²⁹ FCC, *In the Matter of Access Charge Reform*, CC Docket No. 96-262, FCC No. 01-146 (rel. Apr. 27, 2001), at 45. “Our orders addressing ILEC access charges have consistently stated our preference to rely on market forces as a means of reducing access charges. Thus, in setting the level of our benchmark, we seek, to the extent possible, to mimic the actions of a competitive marketplace, in which new entrants typically price their product at or below the level of the incumbent provider. We conclude that the benchmark rate, above which a CLEC may not tariff, should eventually be equivalent to the switched access rate of the incumbent provider operating in the CLEC’s service area... We also adopt rules to ensure that no CLEC avails itself of our benchmark scheme to increase its access rates, and we adopt a separate benchmark for certain firms operating in rural areas.”

default rate for both reciprocal compensation and for access charges. In both cases, CLEC charges are not individually regulated, but the rates will tend in general to be the same as those of the corresponding ILEC. Finally, the CLEC is not required to provide cost data to regulators.

2.5 Reciprocal compensation rates between CLECs

Interconnection of CLECs with ILECs (reciprocal compensation) and with IXCs (access charges) has been previously addressed.

When CLECs interconnect with one another, the rate of reciprocal compensation is unregulated. It is a matter of private negotiation. CLECs can choose to adopt a bill-and-keep regime, which is to say that they can set a reciprocal compensation rate to one another of zero.³⁰

2.6 Termination rates of mobile operators

In implementing the reciprocal compensation provisions of the 1996 Act, the FCC treated mobile operators as if they were CLECs. Thus, when a mobile operator interconnects locally with an ILEC, reciprocal compensation flows from the originating carrier to the terminating carrier. Moreover, there is a presumption that the call termination rates will be symmetric based on the forward looking costs of the ILEC.³¹ Mobile operators, like other CLECs, have the option of demonstrating that their higher traffic-sensitive termination costs entitle them to a higher, asymmetric termination rate.

When a mobile operator interconnects locally with another mobile operator, or locally with a CLEC, the rate for reciprocal compensation is established through unregulated commercial negotiation. These agreements are generally on a bill-and-keep basis.³²

When a mobile operator originates a long distance call, it generally establishes a contractual resale relationship with a long distance carrier. Access fees are not relevant.³³

Mobile operators are not permitted to establish tariffs for access charges where they terminate long distance calls from IXCs. They could, in principle, voluntarily negotiate a compensation rate with an IXC, but this rarely happens. In practice, where a mobile

³⁰ FCC, *Unified Intercarrier Compensation NPRM*.

³¹ For a lengthy discussion of the nuances of mobile-LEC interconnection, see the *Unified Intercarrier Compensation NPRM*, §§78-95. In essence, mobile-LEC interconnection is regulated under §§251-252 of the Communications Act, just as is LEC-LEC interconnection.

³² *Ibid.*, §95.

³³ *Ibid.*, §96. Now that Regional Bell Operating Companies (RBOCs) are permitted to offer long distance service, they usually adopt similar arrangements for origination of long distance calls.

operator terminates a long distance call, it is generally on a bill-and-keep basis (no money changes hands).³⁴

2.7 The move to flat rate pricing

The typical European pattern is one of Calling Party's Network Pays, with mobile termination rates that averaged about of \$0.19 per minute of use.³⁵ Not surprisingly, the retail price in these countries generally exceeds the termination rate, which the carrier views as a cost. These high per minute costs tend to make it difficult for carriers to offer flat rate calling plans.³⁶ A flat rate plan would have to address many business risks, including the prospect that the plan might attract large numbers of self-selected customers who had significantly above-average usage patterns.

Conversely, call termination rates in the United States that are less than \$0.01 in most cases, and zero in many cases, facilitate flat rate pricing.

AT&T Wireless's offer of Digital One Rate in 1998 represents a watershed event in this regard. AT&T offered a plan with flat rates across the United States. As long as the customer used not more than some fixed (and possibly large) number of minutes of air time, the customer could place or receive calls to and from any point in the continental United States. The customer would incur no per-minute charges, no long distance charges, and no roaming charges.³⁷

Not surprisingly, Digital One Rate was immensely popular. The success of Digital One Rate effectively forced its mobile competitors to provide a competitive response; however, initially they were hampered by their lack of nationwide scale. The net result was a wave of consolidation, alliances and joint ventures that ultimately resulted in a nationwide market for mobile telephone services with multiple carriers, each offering nationwide plans offering a large bucket of minutes for a flat monthly fee.

³⁴ Cf. *Ibid.*, §94.

³⁵ European Commission, *9th Implementation Report*, page 18. The figure is for SMP operators, effective August 2003. Euro prices are converted to dollars (here and throughout this paper) at an assumed exchange rate of \$1.20 per Euro. Cf. FCC, *8th CMRS competition report*, at 207.

³⁶ Cf. Laffont and Tirole, *Competition in Telecommunications*, page 190: "It is correct that a change in the access charge need not affect the (absence of) net payment between the operators, but the access charge affects each network's perceived marginal cost and therefore retail prices." See also DeGraba, *op. cit.*, page 8: "... 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."

³⁷ Cf. *8th CMRS Competition Report*, §94: "AT&T Wireless's Digital One Rate ("DOR") plan, introduced in May 1998, is one notable example of an independent pricing action that altered the market and benefited consumers. Today all of the nationwide operators offer some version of DOR pricing plan which customers can purchase a bucket of MOUs to use on a nationwide or nearly nationwide network without incurring roaming or long distance charges." Several mobile operators offer a variant of this plan where there are no roaming charges as long as the customer is using that operator's facilities.

One dramatic result has been a reduction in roaming charges. While roaming charges comprised 14% of mobile revenues in 1995³⁸, they represented just 5% of mobile revenues in 2002, and 4% in 2003³⁹.

Today, flat rate plans are becoming increasingly prevalent for all forms of telephony.⁴⁰ As ILECs were permitted to offer long distance services, they typically offered flat rate plans with unlimited domestic long distance.⁴¹ Traditional long distance carriers offer combined local and long distance service at a flat rate.⁴² IP telephony service providers commonly offer unlimited domestic calls at a flat rate.⁴³

2.8 Summary of reciprocal compensation and access charge arrangements

Reciprocal compensation arrangements are graphically summarized in Table 1, where codes A and B are explained below:

Origination	Termination		
	ILEC	CLEC	Mobile
ILEC	A	B	B
CLEC	B	A	A
Mobile	B	A	A

Table 1. Reciprocal compensation.

A – Terms are established through voluntary negotiations, often as bill-and-keep.

³⁸ Cellular Telecommunications and Internet Association, *Semi-Annual Wireless Industry Survey* (see <http://www.wow-com.com/industry/stats/surveys/>).

³⁹ Ibid.

⁴⁰ These flat rate plans are truly flat rate, whereas the mobile plans are generally two part tariffs. The usage charges of the mobile plans are usually set to very high levels (in the range of \$0.40 per MoU). They are not so much intended to be used, as to punish consumers who purchase bundles that are too small. The common feature between the mobile plans and the newer truly flat rate plans is a movement away from meaningful usage charges.

⁴¹ Verizon, for example, offers 1,000 minutes of long distance service for prices in the range of forty dollars per month. See: http://www22.verizon.com/ForYourHome/sas/res_fam_LongDistancePlans.asp.

⁴² See, for instance, <http://www.consumer.att.com/plans/bundles/>. Prices in the range of \$49.95 for local service plus unlimited domestic long distance are not uncommon.

⁴³ For example, Vonage offers unlimited calls to or from the U.S. and Canada for \$29.99 a month. See www.vonage.com.

B – Where the terminating operator is an ILEC, reciprocal compensation is paid to the ILEC at a rate based on the ILEC’s forward looking marginal cost. Where the terminating operator is a CLEC or mobile operator, reciprocal compensation is paid to the CLEC or mobile operator at a rate based on the ILEC’s forward looking marginal cost unless the CLEC or mobile operator can demonstrate a higher forward looking marginal cost.

Access charge arrangements flow from the IXC to the operator associated with origination or termination of the call. These arrangements are summarized in Table 2 below. The left column represents access charges due to the originating operator, while the right column represents access charges due to the terminating operator.

	Origination	Termination
ILEC	C	C
CLEC	D	D
Mobile	E	F

Table 2. Access charges.

- C – Access charges are due to an originating or a terminating ILEC in accordance with CALLS, at rates limited to \$0.0055-\$0.0065 for (large) rate cap LECs. Somewhat higher rates are permitted for (small or rural) rate-of-return LECs.
- D – Access charges may be tariffed by an originating or a terminating CLEC at rates up to those of the corresponding ILEC, unless a higher rate is voluntarily agreed.
- E – The originating mobile operator usually contracts with the IXC to resell minutes, so access charges are irrelevant.
- F – No access charges are payable to a terminating mobile operator unless the parties agree otherwise.

2.9 The significance of symmetry

As we have seen, the call termination system in the U.S. has a strong tendency toward symmetry in the rates charged for reciprocal compensation, and toward identical access charge rates for wired carriers in the same geographic area (whether ILEC or CLEC). These characteristics serve to prevent many forms of regulatory arbitrage, including exploitation of the terminating monopoly.

ILEC-CLEC and ILEC-CMRS reciprocal compensation rates are generally symmetric, and set at a rate that reflects the marginal cost of the ILEC.

ILEC-ILEC, CLEC-CLEC, CLEC-CMRS, and CMRS-CMRS reciprocal compensation rates are determined through voluntary negotiations, and in many cases are set to zero (bill-and-keep). ILEC-ILEC and CMRS-CMRS interconnection is usually on a bill-and-keep basis.⁴⁴ Traffic patterns are usually in rough balance in these cases; consequently, not much money is likely to change hands between the carriers due to reciprocal compensation.⁴⁵ The carriers presumably choose to minimize transaction costs by avoiding the need to account for traffic and deal with disputes. The zero rate also avoids the business risk associated with the possibility that the balance of traffic might shift in an unfavorable direction over time. The mitigation of this risk serves in turn to facilitate the use of flat rate pricing.

If traffic were significantly imbalanced, voluntary negotiations of symmetric rates would not lead to low or zero rates. The carrier that terminates more calls than it originates would prefer a high rate, while the carrier that originates more call than it terminates would prefer a low or zero rate. Carriers in developing countries tend to terminate far more calls from carriers in developed countries than they originate. Under these circumstances, carriers in developing countries will *ceteris paribus* tend to prefer high call termination rates (which can be orders of magnitude in excess of marginal cost) over low or zero rates.

The presumptions of symmetry in reciprocal compensation rates, and of CLEC-ILEC parity in access charge rates, also serve to reduce regulatory burdens. ILECs must offer call termination to CLECs and mobile operators at rates based on the ILEC's forward looking costs.⁴⁶ CLECs and mobile operators need not cost-justify their rates, since their rates are routinely based on those of the ILEC.⁴⁷

The presumption of symmetry has important consequences. In most European countries, large asymmetries in termination rates exist between wired carriers (who are typically subject to termination rate regulation) and mobile operators (who historically have not been subject to termination rate regulation). Rates often differ by an order of magnitude.⁴⁸ This asymmetry has effectively transferred billions of dollars from fixed operators to mobile, creating an irrational subsidy. The U.S. has avoided this market distortion, largely through the use of symmetric call termination rates.

⁴⁴ FCC, *Unified Intercarrier Compensation NPRM*, at 9 and 95.

⁴⁵ Note, however, that the level of charging will tend to affect their perception of marginal cost, and is thus likely to influence their pricing decisions. See Laffont, Rey and Tirole (1998a), and also Laffont and Tirole, *Competition in Telecommunications*, page 190.

⁴⁶ The access charge rates established by CALLS are claimed to correspond approximately to cost-based rates.

⁴⁷ CLECs and mobile operators have the prerogative to attempt to justify a higher reciprocal compensation rate based on costs higher than those of the ILEC, but this is rarely done in practice.

⁴⁸ European Commission, *9th Implementation Report*, page 18: "... although there has been a decrease in interconnection charges, their level remains on average more than 9 times higher than fixed-to-fixed interconnection charges (double transit)."

3. The U.S. mobile market in a global context

This section of the paper evaluates the effectiveness of the U.S. call termination system in terms of its impact on the marketplace. We confine ourselves to the mobile marketplace because it is in regard to mobile telephony that the U.S. call termination system is conspicuously different from that of other countries, and also because the marketplace differences between the U.S. and other countries are more dramatic for mobile telephony than for fixed.

The low or zero termination fees that exist in the United States tend to facilitate flat rate mobile pricing. By contrast, high mobile termination rates in Europe and elsewhere tend to enforce high charges per mobile minute of use, but also support low initial cost for mobile service (due to handset subsidies, pre-paid calling card plans, and other incentives to consumers).

The relative impact is as might be anticipated: the European pattern has encouraged rapid adoption of mobile telephone service, but has also had a tendency to depress usage of those phones (expressed in minutes of use per month). Conversely, the U.S. approach has led to slower adoption of mobile telephone service, but has encouraged much higher utilization of mobile phones.⁴⁹

⁴⁹ Cf. Crandall and Sidak: “Mobile subscribers in MPP countries appear to use their mobile phones more intensively, presumably because of the pricing structure that MPP elicits from competitive MNOs.”

3.1 Mobile penetration

Table 3⁵⁰ is a widely cited comparison of mobile penetration, usage, and revenue per minute in several leading global economies, as of late 2002.

Country	CPP or MPP	Penetration (%)	Share of Prepaid (%)	MOUs	Revenue per Minute (\$)
USA	MPP	49	5	458	0.12
Canada	MPP	37		270	0.11
UK	CPP	85	69	132	0.22
Germany	CPP	72	54	72	0.29
Italy	CPP	93		121	0.20
France	CPP	63		156	0.20
Finland	CPP	85		146	0.24
Japan	CPP	62	3	170	0.30
South Korea	CPP	68	1	296	0.10
Australia	CPP	68		173	0.16

Table 3. Characteristics of mobile markets.

Crandall and Sidak have analyzed the underlying penetration data, particularly as regards Canada and the United States (see Figure 3), and have found that “...if the growth rate continues to follow this S-shape pattern, mobile penetration in the United States should equal the penetration rates realized in most CPP countries between 2008 and 2014. The growth in mobile subscribers in Canada is similarly impressive—26.8 percent in 2000, 22.3 percent in 2001, and 11.8 percent growth in 2002. ... [M]obile penetration in Canada and the United States will likely equal the penetration rates of CPP countries in the near term ...”⁵¹

⁵⁰ FCC, *8th CMRS Competition Report*, Table 12. Cited data sources are: Linda Mutschler, *Global Wireless Matrix 4Q02*, Global Securities Research, Merrill Lynch, Apr. 2, 2003; and Linda Mutschler, *The Next Generation VII*, Global Securities Research, Merrill Lynch, Feb. 21, 2003. Per the *8th CMRS Competition Report*, “average MOUs include both incoming and outgoing traffic, and usually exclude traffic related to mobile data services”.

⁵¹ Sidak, J. Gregory and Crandall, Robert, “Should Regulators Set Rates to Terminate Calls on Mobile Networks?” *Yale Journal on Regulation*, Vol. 21, 2004, <http://ssrn.com/abstract=462041>.

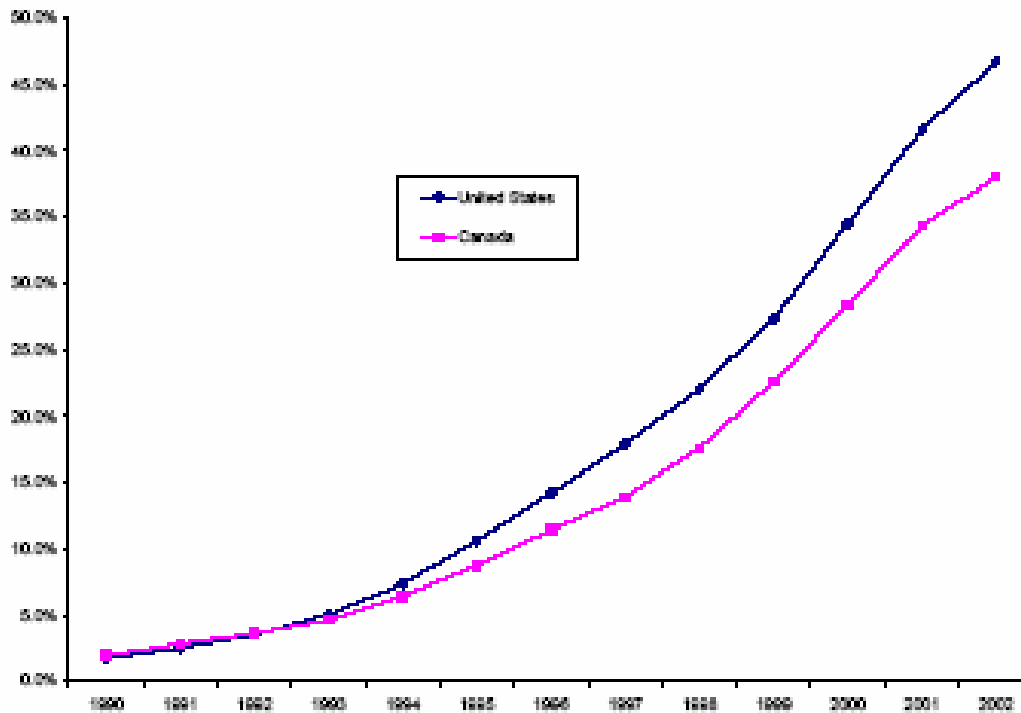


Figure 3. Canadian and U.S. Mobile Penetration Rates, 1990-2002.⁵²

3.2 The cost of mobile services

Figure 4 is a restatement of Table 3. It relates the cost per minute (in U.S. dollars) of mobile usage to average Minutes of Use (MoU) per month, based on the data in Table 3.⁵³ In fitting a regression curve to the data, we have somewhat arbitrarily assumed a linear relationship. The data show the expected negative correlation.

⁵² Crandall and Sidak, op. cit.

⁵³ Again, per the 8th CMRS Competition Report, “average MOUs include both incoming and outgoing traffic, and usually exclude traffic related to mobile data services”.

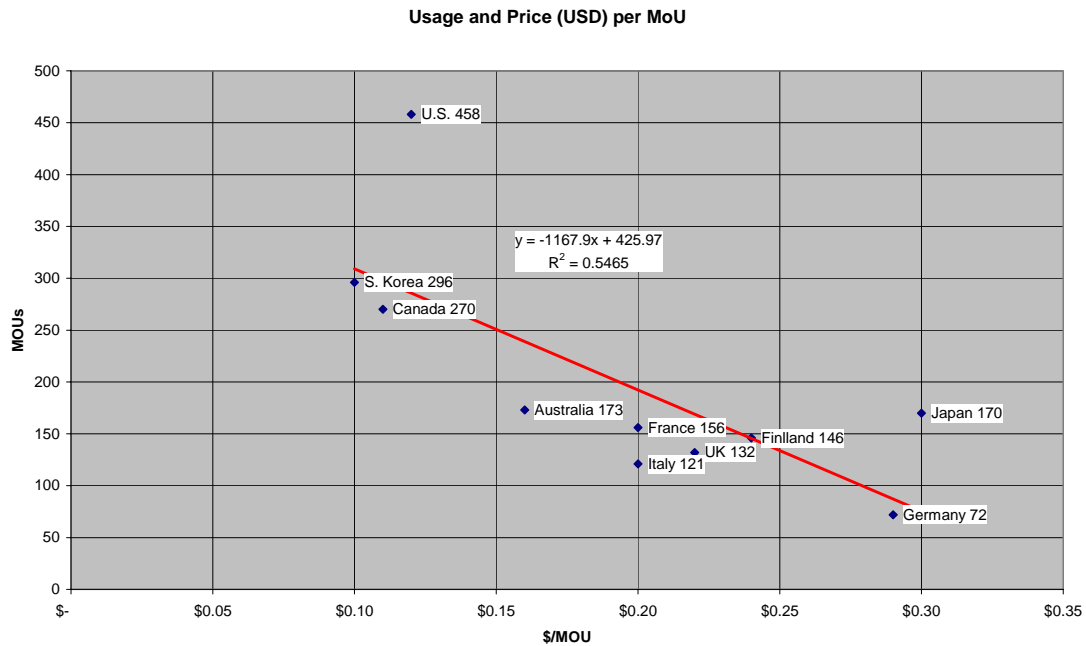


Figure 4. Usage versus price per MoU for several developed countries.

Tempting as it might be to interpret the downward slope as corresponding to demand elasticity, it is not formally correct to do so. These are not the same consumers. A consumer in France cannot in reality switch to a Korean mobile phone operator. Furthermore, there are significant differences among these countries as regards calling preferences, and also as regards disposable income. Nonetheless, it is fair to say that the data suggest that demand is elastic.

It is often instructive to examine the outliers and residuals of a regression curve. In this case, the United States and Germany represent interesting cases.

At 458 MoU, the United States demonstrates considerably more usage than its average price per minute might otherwise lead us to expect. This probably reflects consumer response to buckets-of-minutes plans: “[A] a U.S. mobile subscriber who opts for a large bundle of minutes with virtually unlimited night and weekend minutes perceives that the incremental price of using a wireless minute is virtually free, whereas a mobile subscriber in the U.K. does not have the same perception.”⁵⁴

It is perhaps noteworthy that the U.S. experiences much higher MoU than either South Korea or Canada, even though the average prices per MoU of all three are similar. Equally intriguing is the similarity in price per minute and the MoUs between South Korea and Canada, even though the former is a CPP environment, and the latter an MPP environment. To the extent that the MoUs represent consumer response to perceived pricing, this is not so surprising. We could reasonably expect that consumers would

⁵⁴ FCC 8th CMRS Competition Report, §204.

respond to the price per minute, which they experience directly, and not to the CPP/MPP distinction, which is not directly visible to them.

Germany poses more of a riddle. Price per MoU is much higher than that of its European neighbors, so it is not surprising that MoUs consumed per month are much lower than those in many European countries. When one considers the Average Revenue per User (ARPU), the difference becomes particularly striking (see Figure 5). For any point in Figure 4, the associated ARPU is simply the area under the rectangle that the point forms with the origin (i.e. the product of MoUs and price per MoU). Germany's rectangle is long and low, and its ARPU is consequently significantly less than that of many of its European neighbors.

Termination rates alone cannot explain this anomaly. German termination rates are in the range of \$0.17 per minute,⁵⁵ not very different from the European average of about \$0.19 per minute.⁵⁶ They cannot fully explain retail prices in the neighborhood of \$0.29 per minute.

Analysis by Sanford Bernstein supports these findings.⁵⁷ "Germany continues to leave value on the table relative to the other 4 Major European markets in service revenue per pop and end customer spending per pop... Based on 2003 levels, Germany's monthly service revenue per pop is €18.7 compared with a €25.7 average for the rest of Europe (27% smaller). Germany's monthly end customer spending per pop is also smaller (23%) than the average of the other 4 Major European markets (€15.8 versus €20.4)."

In a competitive market, and assuming that demand is reasonably elastic, one might normally expect that German mobile operators would find it profitable to lower the price per MoU in order to increase ARPU to levels more comparable to those of other European countries. The data suggest that this might generate a very substantial increase in revenue. Why does this not happen? Is the market less competitive than might be expected, or are other, more subtle factors at work?⁵⁸ Or is this simply a case, as one market participant has suggested, where the players know what they need to do, but have not yet found the right way to implement and market their services?

⁵⁵ Arno Wirzenius (for the Ministry of Transport and Communications, Helsinki), *Mobile Pricing and Interconnection Regimes*, 17 May 2004. See page 12. Price is net of VAT. Euro prices are converted to dollars (here and throughout this paper) at an assumed exchange rate of \$1.20 per Euro.

⁵⁶ European Commission, *9th Implementation Report*, page 18. The figure is for SMP operators, effective August 2003. Euro prices are converted to dollars (here and throughout this paper) at an assumed exchange rate of \$1.20 per Euro. Cf. FCC, *8th CMRS competition report*, at 207.

⁵⁷ Andrew J. O'Neill and J. Kyle Raver, "Euro Wireless: New T-Mobile contract bundles to start catch-up of German wireless spend to average European levels", 16 January 2004.

⁵⁸ The same Bernstein analysis observes that the two large operators in this market have spectrum limitations, and may therefore perceive high costs. This cannot fully explain the anomaly, but it may be a contributing factor.

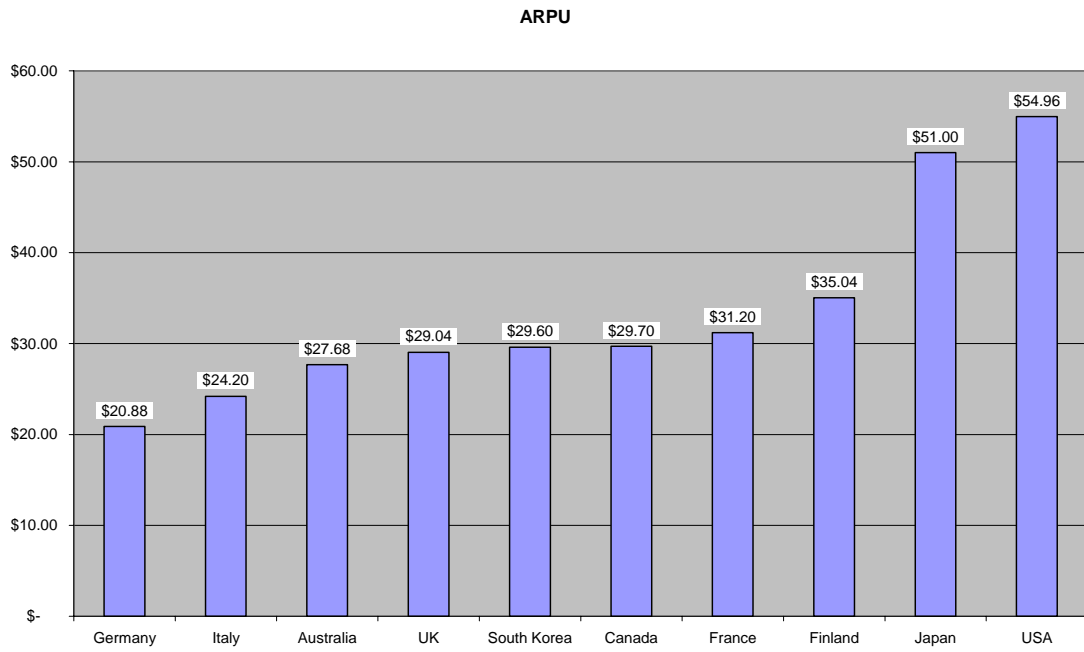


Figure 5. ARPU for several developed countries.

4. Evolution of call termination in Europe and the U.S.

This section of the paper briefly contrasts current and projected developments in the European Union to those in the United States. It closes with some brief comparative observations.

4.1 Next steps for the European Union

The European Union is in the process of implementing a New Regulatory Framework (NRF) for electronic communications.⁵⁹ Under the NRF, the European Commission identifies a number of markets where carriers are likely to possess SMP and where, accordingly, *ex ante* regulation (i.e. regulation prior to a competitive abuse) may be appropriate. National Regulatory Authorities (NRAs) interpret those markets in terms of their national circumstances, identify firms (if any) that have Significant Market Power (SMP) on those markets, and apply minimal “proportionate” remedies to address the harms that SMP is likely to engender.

The Commission has addressed the call termination problem through the market definition mechanism. The Commission has identified eighteen markets that are potentially amenable to *ex ante* regulation. Among these are markets for call termination *to the customers of an individual fixed or mobile operator*.⁶⁰ Defining the market in this way will tend to create a strong presumption of SMP in regard to termination of calls for that operator’s own customers, unless rebutted by specific facts. If SMP is found, the NRA determines what regulatory remedies are appropriate. This process may eventually lead to cost-based termination rates for far more carriers than are presently subject to them.

This overall approach is logical, and is in fact the most natural way to deal with high termination fees under the NRF. At the same time, it will tend to lead to highly regulated

⁵⁹ See J. Scott Marcus, Federal Communications Commission (FCC) Office of Strategic Planning and Policy Analysis (OSP) Working Paper 36, “The Potential Relevance to the United States of the European Union’s Newly Adopted Regulatory Framework for Telecommunications,” July 2002, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-224213A2.pdf. The article and derivative works also appear in: *Rethinking Rights and Regulations: Institutional Responses to New Communications Technologies*, Ed. Lorrie Faith Cranor and Steven S. Wildman, MIT Press, 2003; in the *Journal on Telecommunications and High Technology Law* 111 (2003); and in the *2004 Annual Review* of the European Competitive Telecommunications Association (ECTA). The relevant European Directives appear in the bibliography of this paper.

⁶⁰ *Commission Recommendation of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services*, Official Journal of the European Communities, L 114, (2003/311/EC), May 8, 2003. Market 9 is “Call termination on individual public telephone networks provided at a fixed location”; market 16 is “Call termination on individual mobile networks.”

outcomes. In the cases that have been notified⁶¹, it has generally led to heavy regulatory controls, including cost-orientation for termination rates.

For now, *it is vitally important that regulators stay the course in order to reduce regulatory asymmetries*. The magnitude of the economic distortions is such that a regulated glide path may be necessary in some Member States.

One promising development that bears watching is the termination rate scheme recently notified by the Swedish NRA.⁶² The NRA required the largest incumbent to implement a full system of cost accounting and cost-oriented termination rates. Two other operators were required to provide cost accounting, but merely to charge “reasonable and fair prices”, presumably no higher than those of the incumbent. The remaining small operators must charge reasonable and fair prices, but were obliged to provide cost accounting data only upon the regulator’s request.⁶³ U.S. experience suggests that systems of this type can achieve low termination rates while burdening only a few operators with full cost accounting and cost orientation.

4.2 Next steps for the United States

The call termination system in the United States is not engendering a mobile termination problem, but intercarrier compensation regimes are nonetheless under significant stress due to increasing competition, differences in the price of different forms of access, and technological and market convergence.

By 2001, the FCC had recognized that the termination mechanisms had become unwieldy and complex. “These regulations treat different types of carriers and different types of services disparately, even though there may be no significant differences in the costs among carriers or services.”⁶⁴ At the time, mobile telephony and Internet services were placing significant strains on the system.

⁶¹ See <http://forum.europa.eu.int/Public/irc/infso/ecctf/library>.

⁶² See the Commission’s comments of 9 June 2004, “Case SE/2004/0050: Call termination on individual public telephone networks provided at a fixed location in Sweden: Comments pursuant to Article 7 (3) of Directive 2002/21/EC”, at <http://forum.europa.eu.int/irc/Download/kVeUAoJ-mTGtGV2OGE-pBsCwUINUn4c0xyNLZFuh2HJ26CawHjUsPDIq6wVThaNslk30u/SG%20Greff%20%282004%29%20D%20202305.pdf>.

⁶³ The proposed approach of the Irish NRA is somewhat similar. See “Consultation on Remedies – Wholesale voice call termination on individual mobile networks”, document 04/62b, 8 June 2004. See also the UK approach in case UK/2003/0003.

⁶⁴ FCC, *Unified Intercarrier Compensation Regime NPRM*, §5. In her separate statement regarding this NPRM, Commissioner Susan Ness noted that “...we still have in place today a system under which the amounts, and even the direction, of payments vary depending on whether the carrier routes the traffic to a local carrier, a long-distance carrier, an Internet provider, or a CMRS or paging provider. In an era of convergence of markets and technologies, this patchwork of regimes no longer makes sense. What had been a historical artifact may have become an unsustainable anomaly.” Chairman Powell observed that “...the rates for interconnecting with the phone network vary depending on the type of company that is doing the interconnecting. In a competitive environment, this leads to arbitrage and inefficient entry incentives, as companies try to interconnect at the most attractive rates.”

A number of economists have suggested that call termination charges under CPNP regimes do more harm than good. In 2001, the FCC published two staff working papers, one by Patrick DeGraba, the other by Jay Atkinson and Christopher Barnekov. Both papers argued for elimination of call termination fees, and a migration to a bill-and-keep (i.e. zero fee) regime.⁶⁵

DeGraba noted that U.S. mobile operators typically negotiate bill-and-keep arrangements among themselves, and that these arrangements appear to work well with no significant regulatory oversight.

Analogously, Internet service providers who “peer”, or exchange traffic for their respective customers, often do so on a bill-and-keep basis. Laffont, Marcus, Rey and Tirole have noted that, in economics terms, call termination differs from charges associated with Internet peering primarily as a result of the “missing price”: receivers do not pay for receiving calls.⁶⁶ Thus, the economics of Internet interconnection may provide valuable insights in regard to call termination.

DeGraba also argues that the recipient of a telephone call derives some benefit from that call, and should consequently share in the price of the call.

The FCC issued an NPRM in 2001 in which they proposed to radically simplify the system by migrating to a bill-and-keep regime.⁶⁷ The FCC has not ruled on this NPRM.

Today, IP telephony is placing new strains on the call termination system. The FCC has once again raised the question of how best to deal with call termination fees, this time in the IP Enabled Services NPRM.⁶⁸

4.3 Concluding Remarks

The U.S. call termination system has arguably been less problematic than that used in Europe; however, both systems face significant stresses in the years to come. No country has implemented a system that fully and simultaneously avoids regulatory distortions and

⁶⁵ See Federal Communications Commission (FCC) Office of Strategic Planning and Policy Analysis (OSP) Working Papers 33 and 34: Patrick DeGraba, “Bill and Keep at the Central Office As the Efficient Interconnection Regime”; and by Jay M. Atkinson, Christopher C. Barnekov, “A Competitively Neutral Approach to Network Interconnection”, both December 2000. Both are available at <http://www.fcc.gov/osp/workingp.html>.

⁶⁶ Jean-Jacques Laffont, J. Scott Marcus, Patrick Rey, and Jean Tirole, IDE-I, Toulouse, “Internet interconnection and the off-net-cost pricing principle”, *RAND Journal of Economics*, Vol. 34, No. 2, Summer 2003. An earlier version of the paper is available at <http://www.idei.asso.fr/Commun/Articles/Rey/internet.pdf>. “Finally, let us compare Proposition 1 with the results in Laffont, Rey, and Tirole (1998a) and Armstrong (1998) for interconnection of telephone networks. A key difference with this telecommunications literature is that in the latter there is a missing price: receivers do not pay for receiving calls... In sum, the missing payment affects the backbones’ perceived costs, and it reallocates costs between origination and reception.”

⁶⁷ FCC, *Unified Intercarrier Compensation NPRM*.

⁶⁸ FCC, *In the Matter of IP-Enabled Services*, WC Docket No. 04-36, released March 10, 2004.

addresses convergence challenges for all communication services. Further evolution is necessary and inevitable on both sides of the Atlantic.

The differences in approach and philosophy are significant. Europe is on a path that may lead to more intensive regulation of call termination; the United States is likely to continue on its generally deregulatory trajectory. These differences are largely a function of path dependencies – Europe and America are starting from somewhat different points today.

As we move forward, there is great value to policy experts and practitioners on both sides of the Atlantic in developing a comprehensive understanding of the strengths and weaknesses of both systems. This paper has sought to contribute to that understanding.

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