

THE RURAL CONUNDRUM:  
INTRASTATE ACCESS CHARGES IN PENNSYLVANIA

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EXECUTIVE SUMMARY

Introduction

Access to comparable telephone services at affordable prices for all telephone customers, wherever they live, has been a policy goal of both the Federal government and the Commonwealth of Pennsylvania for decades, with the federal government having the further objective to achieve comparable rural and urban prices. At the same time both have also set out to promote competition in the telecommunications market as a means for achieving most of their policy goals. Indeed, when applied to serving customers in high-cost rural areas, these two policies can sometime conflict. Resolving that conflict is the “rural conundrum”.

Because it often costs significantly more to provide service in rural areas than in urban ones, and since there was a need to adopt policies, which would ensure comparable prices to consumers in both, balancing policies were adopted. These have included subsidies to rural providers as some traditional rural telephone companies (incumbent local exchange carriers or “ILECs”) argue that as a result of the policy goal of similar pricing across the state they are being required to provide services at prices that are set below cost. On the other hand, the policy of promotion of competition calls for the replacement of market-distorting subsidies with transparent, cost-based business transactions, in which prices are based on the cost of the product or service, and companies compete for customers based on value, price and quality, not government subsidies.

What at first may seem as an economic modeling problem that can be resolved by these cost/price-balancing acts becomes more complicated as a result of dramatic changes taking place in the communications marketplace. Traditional landline operators find themselves in recent years in competition with new powerful competitors such as mobile phone operators, cable phone services providers, and Internet-based voice services, all of which can provide functionally equivalent services.

Consequently, some of the ILECs in the state’s rural areas, caught in a vise of high costs, capped prices, emerging competition and changing technologies, are seeking alternative means to enhance their revenues. There are two primary avenues through which they seek to do this. The first is to raise the rates (“access charges”) charged to long-distance companies to connect (“interconnection”) to their networks (thus receiving indirect support from all of that company’s customers), and the other is seeking distributions from a broad-based fund for “universal service”, created in Pennsylvania as a means to offset some of these higher costs (thus recovering some of their costs from the customers of companies contributing to the fund). Access charges in particular introduce peculiar inefficiencies into the market, since the rates differ based on the technology platform and the identity of the interconnecting party: wireline long-distance carriers that pay higher rates than competing technologies are placed at a competitive disadvantage.

Pennsylvania law, and the Pennsylvania Public Utility Commission (“PA PUC”), have acknowledged this complex dynamic and attempted to deal with it through balancing rates, incentives, access charges and universal service policy. While doing so, the price for protecting the lowest rate for the last voice-only rural ILEC customer becomes progressively higher. However, the inherent structural tensions appear to be coming to a head. For reasons set forth in this study, the current system is unsustainable over the longer term.

Even if a social policy were adopted to overtly continue subsidies, it would be at best a short-term solution, as the more fundamental problem is the migration away from the traditional analog voice-based phone service (the public switched telephone network or “PSTN”) to mobile, cable and “broadband” Internet systems. The technology and business model of the traditional “wireline” telephone service is becoming progressively obsolete. As customers flee the old voice-only system for digital packages of services, those rural telephone carriers must now make the transition to “broadband” networks.

From a public policy perspective, “universal broadband” is a desirable outcome, and policies should not unduly inhibit or burden this transition, but the concern is that subsidies to ILECs for their regulated phone business may be used to finance their entry into the competitive broadband business, giving them an unfair competitive advantage in that market.

This is not just a Pennsylvania issue, so this study reviews how it is being addressed in other states. It is not just a U.S. issue. The problem of monopoly control of the final link to the customer (the “terminating monopoly”) is faced all over the world. Accordingly, we have reviewed an assortment of international comparisons. This Report is intended to shed some light on this issue for those who will be making decisions about future directions. It is a study in three parts: the first reviews the history and current status; the second looks at an economic analysis of the consumer consequences of reducing rural intrastate access charges; and the third is a series of informative international comparisons.

## Section 1. Background: Understanding the Rural Access Issue

Prior to 1984, when the Bell System was unitary, that is, both local and long-distance services were part of the same entity, it was simply a matter of internal bookkeeping to use large-area geographic rate averaging and subsidies from business users and long-distance users to hold down and equalize telephone rates. When the Bell System was broken up in 1984, the intention was to separate “monopoly” services (local companies) from “competitive” services (long distance). Competitive services were supposed to be cost-based, and monopoly services were rate regulated. The U.S. Federal Communications Commission (FCC) was tasked to oversee the process and introduce cost-based analysis into interconnection. Then, due to changes in policy driven by evolving markets and technologies, Congress adopted the Telecommunications Act of 1996 introducing competition into all aspects of telecommunications. In introducing competition, the FCC was charged with moving interconnection charges closer to costs and supporting high-cost areas/low-income subscribers through a national universal service fund.

Due to the bifurcated structure of telecommunications regulation, in which long distance services within a state are regulated by the state, the Commonwealth of Pennsylvania has also the need to

address the topic and has held continuous proceedings on the matter, one of which is currently pending following the filing of comments by the respective parties.

The historical developments leading up to the breakup of the Bell System are reviewed in part I of this Report . They are followed by a description of the changes that needed to be made in order to address interconnection regulation through a process separating the costs of local and long-distance carriers (“separations”) while seeking cost-based pricing. The events leading up to and resulting in the Communications Act of 1996 and the introduction of competition at all levels and areas are subsequently discussed. Special detail is provided with regard to the role of the states in the process and to the specific changes implemented by the FCC with respect to intrastate access charges in general and the handling of rural telcos in particular. The special case of rural telcos, their cost variables and the issue of subsidies are then discussed in further detail.

The history of access regimes in Pennsylvania is discussed within this historical context. The policies, significant laws and regulatory developments, important proceedings and pending issues are described. A discussion of the ways and means in which other states have handled the same issue, using a combination of rate increases over a transitional period and some modest continued offsets follows. The Report’s first part concludes with a description of the rising new competitive challenges: wireline substitution with mobile; cable telephony, and a range of internet-base substitutes.

The wireline telephone business is in a declining spiral. Consumers are turning to packages of services and as more move away from purchasing landline services as a single product, costs of providing voice services over wires spread over a diminishing base. This trend is likely to continue. Given the migration to broadband, at some point it may be cheaper to offer consumers only a broadband connection and let them choose the services they’re interested in. This transition will lead to new challenges: Equity in competition; selective and irrational subsidization; questions of fairness; balancing efficiency, with the demand for cutting edge technologies; balancing intrastate policies with those in neighboring states; making subsidies transparent and transitioning to cost-based systems. At same time regulators are required to address situations where there is no competition, and no reasonable prospect of competitive entry while aspiring to be fair to incumbents, recognizing their historic investments, promoting real competition, and sustaining social policies.

The issue of traffic pumping/access stimulation is a manifestation of the imbalances in the access charge regime. While the problem may gradually be reduced and eliminated as the basis of transmission on broadband networks evolves away from “minutes of use,” it is still very much a troubled issue in the short run. It is clearly a practice inconsistent with the move to reduced and equal access charges, and is an artificial and arguably impermissible practice under federal and state regulations. Notwithstanding the arguments of its proponents, it is a flawed way to try to solve the underlying problem of the economics of rural, high-cost carriers. However, to simply prohibit it, which makes logical sense, will simply relocate the problem to the universal service fund and/or higher end-user/customer rates. The general argument of this paper is that the latter is preferable, if implemented over time, in stages, and that it can be done in a manner that does not induce “rate shock” on rural consumers, while rationalizing the economics of the service and

reducing opportunities for arbitrage. In the short run, the FCC has several open proceedings which it could, and should, use to address this matter to provide clarity, stability and predictability for all of the stakeholders.

## Section 2. Access Charges: Economic Theory and Consumer Impact

In this section, we examine the impact of reducing intrastate access charges on social welfare.

As we have seen, access charges are intended to compensate local loop providers for the usage of the local networks for traffic origination and termination. Due to historical circumstances, they have also provided a cross-subsidy from long-distance to local service, with actual charges bearing little relation to price. In economic terms, access charges have a definite role to play, for example to enable only efficient entry into upstream and downstream markets or to check the monopoly power of incumbents over bottleneck facilities.

A number of approaches to designing economically justifiable access charges have been put forward over time—including cost-based pricing, efficient component pricing, and price caps. But the actual practice of determining access charges, especially at the state level where intrastate access rates are set, has taken little inspiration from economic theory. Instead, the rates are determined through negotiations between interested parties, and often settle at levels that are politically sustainable—but way above actual costs.

Three cases are considered, the first in which intrastate access charges are reduced to the level that each LEC currently charges for interstate long-distance access; and the second, in which companies reduce their intrastate access charges to the national average interstate access charge; and the third where the companies reduce their intrastate access to Verizon's intrastate access charges. Going by precedent, these reductions in access charges are expected to lead to lower long-distance prices, stimulating demand. Interexchange carriers and consumers benefit as a result. Local exchange companies lose a share of their access revenues from existing usage minutes, but gain additional revenue from the new usage stimulated by lower prices. The net benefit to local exchange companies is dependent on the magnitude of the demand-stimulating effect of lower prices (therefore on the price elasticity), and it is possible that local exchange companies may realize a net increase in access revenues if the elasticity is sufficiently high. But at the levels of price elasticity most often reported in the economic literature, the net benefit to local exchange companies is still negative. Overall social welfare, including gains to interexchange carriers, consumers and local exchange companies is strongly positive, approximately \$26-28 million in the three cases we considered.

## Section 3. International Comparative Review of Access Regimes

Access regulation has been a major topic of concern for regulators worldwide as they introduced market mechanisms to the process of liberalizing their telecommunications industries. While the United States' telecommunications market differs significantly from those in Europe and Asia, and while traditionally the European and Asian regulatory frameworks imported American concepts, recent years have seen a rise in levels of competition as well as in the

penetration of new technologies in Europe and Asia that would suggest the United States could now learn from others.

#### Europe:

- In the New Regulatory Framework of 2003, among the markets designated as non-competitive is “call termination on individual public telephone networks provided at a fixed location.” Nearly all National Regulatory Authorities (NRAs) impose some form of ex ante regulation on call termination markets, including price controls.
- The “Common Position” on call termination of the European Regulatory Group (“ERG”) which is comprised of the heads of all relevant national authorities in the Union, states that the ideal situation would call for eliminating all existing asymmetry in call termination relationships among carriers.
- The only situation that the ERG deems as justifying any form of temporary asymmetry among carriers is one that favors new entrants. In those situations termination rates should be brought down to the “cost of an efficient operator” as soon as possible. The “costs incurred by a hypothetical efficient operator” should determine termination rates.
- The European Commission’s position is that “National Regulatory Authorities should set termination rates based on the costs incurred by an efficient operator. This implies that they would also be symmetric.” The relevant cost methodology to evaluate efficient costs across Europe is long-run incremental costs (LRIC).
- Fixed termination rates across Europe range on average from 0.57 to 1.13 euro cents per minute.

#### United Kingdom:

- OFCOM, the British regulator, considers every network, be it fixed or mobile, to be a separate market. The result of this determination is that each operator’s prices for incoming calls are regulated relative to the level of control they have in the outgoing call market.
- Practically, when called upon to determine interconnection disputes, OFCOM calculates charges for call termination on fixed networks on the basis of “reciprocal charging,” which means they are identical for all parties involved.
- The European Union has recently urged OFCOM to impose price controls on all fixed network operators and to add non-discrimination obligations to the existing obligation to provide termination on fair and reasonable terms.

#### Israel:

- The price of long distance and local in-country calls was equalized even though the direct cost of a long distance call was double that of a local call.
- The Ministry of Communications enforced a “Bill & Keep” policy for the first two years of operation of a facility-based competitor (the cable company).
- Wireline termination fees were lowered to the equivalent of US\$ 0.01 at peak times and approximately 60% of that tariff for off-peak times.

- VoIP providers are eligible to receive from other interconnecting operators the same tariff that a full licensed “in-country wireline telecommunications services” provider is entitled to, even though it is clear that the cost to terminate a call on a VoIP network is lower than the parallel cost on a circuit switched network.

Japan:

- The Long Run Incremental Cost (LRIC) methodology for calculating interconnection rates was adopted in 2000. Regulatory distinctions between facility based and non-facility based competitors were removed.
- Designated fixed line carriers are required to acquire authorization of the Ministry in order to determine the interconnection rate and are obliged to submit the revised interconnection articles that include actual costs and traffic to the Ministry by the end of each year. Then, the interconnection rates are reviewed and approved by Ministry annually with the interconnection tariffs on fees and conditions established.
- The fixed line termination rates per minute in Japan in 2007-2008 ranged from US\$ 0.0138 to US\$ 0.0237.

Korea:

- To determine interconnection rates Long Run Incremental Cost methodology (LRIC), was instituted. In practice, however, the interconnection pricing framework since 2004 uses Long-Run Average Incremental Cost (LRAIC) as the cost basis for pricing. Fixed and mobile termination (interconnection) rates are reviewed by the KCC biannually on the basis of LRAIC methodology.
- Fixed line termination rates per minute in Korea in 2006-2007 ranged from US\$ 0.0178 to US\$ 0.0203.

There are a number of commonalities among the different access regimes discussed in this study that can serve as a lesson for a regulator and a market seeking clarity:

- Constant clarification and adaptation of policy to changing circumstances;
- Resolve by legislation;
- Reformulation of the jurisdiction of regulatory authorities;
- Decision making at the top national level;
- Overcoming state/regional difference by streamlining of policies nationally.
- All regulatory agencies see in interconnection a tool for or an impediment to the development of fair competition that contributes to industry growth

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## FOREWORD

This is a study about the need for reform of the access charge regime for telephone services in the rural areas of Pennsylvania. Pennsylvania has the largest rural population of any state in the U.S. Because of that it makes an excellent case in which to consider the economic, regulatory and political challenges of serving rural populations during the migration from 20<sup>th</sup> century wired telephone technology to 21<sup>st</sup> century mobile and Internet-based technologies.

Because the telephone business developed early in the U.S. and in Pennsylvania, almost all rural areas have embedded incumbent telephone operators (some for over a century), whose basic technology and business model is rapidly becoming obsolete. If one had a blank sheet of paper on which to design an efficient system to serve rural areas (as is the case in some developing nations), it would not look like the present system.

But the reality is there is no such thing in the U.S. as a “blank sheet of paper.” It is necessary to look at history, economics, regulation, and politics as a backdrop to finding fair ways to migrate the existing system into the emerging broadband network. This usually means balancing values, such as affordable service for all with the goal of enhancing competition while taking into account the obtrusive nature of new technologies. The rapid changes of late in the telecommunications environment have only exacerbated this challenge. Although this issue has been addressed in many states, it is still under consideration in Pennsylvania. This study is intended to provide useful background information for those responsible for decisions, which will shape the future of telecommunications in Pennsylvania.

## THE RURAL CONUNDRUM: INTRASTATE ACCESS CHARGES IN PENNSYLVANIA

*“The regulation of interconnection is becoming the paramount tool of government into the reasonably foreseeable future, replacing the regulation of telecommunications retail pricing, the rate of return, or competitors’ entry.”<sup>1</sup>*

### 1. UNDERSTANDING THE RURAL ACCESS ISSUE

#### 1.1 Origins

##### 1.1.1 Early Developments: Network Effects and Interconnection

Policymakers have often invoked “network economic effects” as a justification for wide-scale regulation of local telephone service. Network economic effects exist when the value of a particular good is determined in large part by the number of other people connected to the same network. The leaders of the Bell System clearly understood the importance of network economic effects. As it noted in its 1908 Annual Report, “[a] telephone--without a connection at the other end of the line--is . . . one of the most useless things in the world. Its value depends on the connection with the other telephone--and increases with the number of connections.”<sup>2</sup>

This appears to be precisely what happened in the early telephone industry. The Bell System had patterned its initial business strategy on Western Union's, which primarily provided long-distance communications to business customers located in large commercial centers. As a result, the Bell System largely ignored small cities, rural areas, and residential areas, not even making much of an effort to connect larger cities to their suburbs. The skeletal nature of the Bell System's network left substantial areas of the country in which new, independent telephone companies could enter without facing any opposition. The independents were thus free to pursue the large number of unserved customers who had no allegiance to the Bell System.

The earliest telephone competition after the fundamental AT&T patent expired occurred without interconnection, but the large number of potential customers without telephone service and the short distance covered by most telephone calls allowed both AT&T-controlled companies and their competitors to flourish without interconnection.<sup>3</sup>

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<sup>1</sup> Noam, Eli (2001), *Interconnecting the Network of Networks*, Cambridge: The MIT Press.

<sup>2</sup> Spulber, Daniel F. and Yoo, Christopher S., “*Toward a Unified Theory of Access to Local Telephone Systems*”. Federal Communications Law Journal, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN: <http://ssrn.com/abstract=1408124>

<sup>3</sup> Brock, Gerald, “*Interconnection Policy and Technological Progress*,” Federal Communications Law Journal, 58 Fed. Comm. L.J. 445, June, 2006, accessed at <http://www.law.indiana.edu/fclj/pubs/v58/no3/f-brock.pdf>

Federal regulation of interstate telephone service began in 1910 with the enactment of the Mann-Elkins Act, which declared interstate telephone and telegraph companies to be common carriers subject to the duty to provide service upon any reasonable request at "just and reasonable rates." The Act also gave the Interstate Commerce Commission (ICC) the power to overturn rates that it found to be "unjust or unreasonable or unjustly discriminatory or unduly preferential or prejudicial," but it did not give the ICC the authority to require the filing of tariffs or mandate interconnection in advance, which had the effect of limiting it to an after-the-fact review of rates. In addition, during this period the ICC focused its attention primarily on the railroads. As a result, the ICC did little to exercise the scant regulatory jurisdiction over telephone service that it did possess.<sup>4</sup>

As AT&T developed a monopoly long-distance network, its control of interconnection between AT&T-controlled telephone companies and the long-distance network became an important source of competitive advantage. The antitrust settlement of 1913, the Kingsbury Commitment, provided the first interconnection requirement, but also led to the end of effective competition and the beginning of regulated monopoly.

During the regulated monopoly era, there were no competitive interconnection requirements. AT&T controlled service on an "end-to-end" basis and prohibited foreign attachments while interconnecting with noncompetitive independent domestic telephone companies and with foreign telephone companies that served geographic areas separate from those served by AT&T.

Congress addressed many of the deficiencies of the Mann-Elkins Act when enacting the Communications Act of 1934. In addition to giving the newly created Federal Communications Commission (FCC) the authority to ensure that interstate telephone rates were just, reasonable, and nondiscriminatory, the Act also addressed the ICC's lack of authority to require tariffs by requiring all interstate carriers to file schedules of charges. At the same time, the Act preserved the preexisting division between federal and state authority by including language providing that "nothing in this chapter shall be construed to apply or to give the Commission jurisdiction with respect to . . . charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communication service . . . of any carrier." The Act also gave the FCC the authority to oversee what became known as the "separations" process (see Section 2.1.2), through which the agency would determine what proportion of the costs of capital equipment used for both local and long distance would be allocated to each service.<sup>5</sup>

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<sup>4</sup> Spulber, Daniel F. and Yoo, Christopher S., "Toward a Unified Theory of Access to Local Telephone Systems". Federal Communications Law Journal, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN: <http://ssrn.com/abstract=1408124>

<sup>5</sup> Spulber, Daniel F. and Yoo, Christopher S., "Toward a Unified Theory of Access to Local Telephone Systems". Federal Communications Law Journal, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN: <http://ssrn.com/abstract=1408124>

The Communications Act of 1934 established a "duty of every common carrier engaged in interstate or foreign communication by wire or radio . . . in cases where the Commission, after opportunity for hearing, finds such action necessary or desirable in the public interest, to establish physical connections with other carriers. . . ." At the time that provision was passed, the relevant connections were among carriers serving separate geographic territories, but the provision stipulated a statutory basis for the Federal Communications Commission ("FCC") to mandate interconnection when competition began.

From the time of the enactment of the 1934 Act until the mid-1960s, regulators and the Bell System entered into a symbiotic relationship. The regulatory authorities condoned the Bell System's monopolization of all aspects of the telephone network. Monopoly control allowed regulators to authorize charging above cost for certain services and to use the excess returns to cross-subsidize other services that were more popular with regulatory constituencies. For example, the FCC used its control over the separations process to allocate to long-distance rates an ever-increasing proportion of the costs of the capital equipment used to provide both local and long-distance service--such as customer premise equipment ("CPE"), the wires connecting individual customers' premises to central offices (commonly known as "local loops"), and the switching equipment located in central offices. The higher long-distance charges were thus used to keep monthly charges for local telephone service low. Similarly, state regulatory authorities used higher charges on business users to cross-subsidize the rates paid by residential users. Finally, regulatory authorities used a system known as "rate averaging" to mandate that all telephone subscribers in the state pay similar rates for service. The effect was to require lower-cost urban users to cross-subsidize the service for higher-cost rural users.<sup>6</sup>

Over time, outside forces began to undercut this arrangement. Competition began to emerge from providers of complementary services. For example, producers of CPE began to seek access to the Bell System's local telephone networks. The emergence of microwave as a means of transmission allowed competition to emerge in long distance as well. Again, after some prodding by the courts, the FCC acceded and allowed competition in long-distance service to emerge.

In addition, a new set of services, originally called "enhanced services" and later called "information services," began to emerge, which combined computing power with transmission to provide innovative new services that went far beyond traditional voice communications. Some of these services were dial-up services, the predecessors to the modem Internet, which used analog modems to make it possible for the first time to connect computers to the network. Other services harnessed computing power in the network itself, typically in the newly digitized switches, to provide new services, such as voicemail, call waiting, and caller ID.<sup>7</sup>

Technological progress, especially the dramatic decline in the price of electronic components, upset the established regulated monopoly industry structure and price patterns during the 1970s. As entrepreneurs recognized that the cost of providing both long-distance service and specialized terminal equipment was below the price charged by AT&T, they attempted to enter

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<sup>6</sup> Ibid.

<sup>7</sup> Spulber, Daniel, and Yoo, Christopher (2009), Networks in Telecommunications: Economics and Law, New York: Cambridge University Press, p. 236.

the industry in competition with AT&T. While the earliest private-line microwave systems operated without interconnection, most competitive entries required some form of interconnection.

### 1.1.2 Competition and Separations

Until the entry of MCI and others into the long- distance telephone market, most telephone subscribers obtained both local and long-distance services from the same company, the pre-divestiture Bell System, owned and operated by AT&T. Its provision of local and intrastate long-distance services through its wholly-owned operating companies was regulated by state commissions. The FCC regulated AT&T's provision of interstate long-distance service. Much of the telephone equipment used to provide local telephone service (such as the local loop, the line that connects a subscriber's telephone to the telephone company's switch) is also needed to originate and terminate interstate long-distance calls.

When AT&T was the only long-distance carrier, there was no formal system of tariffed charges to determine how its subsidiaries, the local Bell Operating Companies ("BOCs"), and the hundreds of unaffiliated, independent LECs would recover the costs allocated to the interstate jurisdiction by the separations rules. Instead, AT&T remitted to these companies the amounts necessary to recover their allocated interstate costs, including a return on allocated capital investment.

In the 1970s, MCI and other interexchange carriers (IXCs) began to provide switched long-distance service in competition with AT&T. However, AT&T still maintained monopolies in the local markets served by its local subsidiaries, the Bell Operating Companies (BOCs). The BOCs owned and operated the telephone wires that connected the customers in their local markets. Other independent (non-Bell) LECs held similar monopoly franchises in their local service areas. MCI and the other IXCs were dependent on the BOCs and the independent LECs to complete the long-distance calls to the end user. In December 1978, under FCC supervision, AT&T, MCI, and the other long-distance competitors entered into a comprehensive interim agreement, known as Exchange Network Facilities for Interstate Access (ENFIA) that set rates that AT&T would charge long-distance competitors for originating and terminating interstate traffic over the facilities of its local exchange affiliates.

In 1983, following the decision to break-up AT&T, the FCC adopted uniform access charge rules in lieu of earlier agreements. These rules governed the provision of interstate access services by all incumbent LECs, BOCs as well as independents. The access charge rules provided for the recovery of the incumbent LECs' costs assigned to the interstate jurisdiction by the separations rules.

Dissatisfaction with the slow FCC resolution of early competitive controversies caused the Department of Justice ("DOJ") to seek a more comprehensive solution through its antitrust powers. The DOJ antitrust suit was settled in early 1982 with the consent decree known as the Modification of Final Judgment ("*MFJ*") that required AT&T to divest the Bell Operating Companies ("BOCs"). The underlying premise of the divestiture requirement was that local exchange telephone service constituted a natural monopoly while long-distance service,

customer-premises equipment, and information services were actually or potentially competitive, and that the competitive problems were the result of AT&T's incentives to resist interconnection with competitors. The divestiture removed those incentives by separating the natural monopoly and potentially competitive sectors of the industry, creating incentives for the BOCs to seek interconnection with a wide range of companies in order to provide services to their customers that they could not provide on their own.<sup>8</sup>

### 1.1.3 Interconnection and the Telecommunications Act of 1996

As technological progress continued, dissatisfaction with the divestiture agreement created pressure for a policy change that contributed to the Telecommunications Act of 1996 ("1996 Act")<sup>9</sup>. The post-divestiture interconnection arrangements between local exchange carriers ("LECs") and long-distance companies were implemented as a set of access charges paid by long-distance companies to LECs for origination and termination of calls. The structure and level of the access charges were regulated by the FCC and were designed to retain aspects of the predivestiture subsidy flow from long distance to local service.

Eventually, competition began to emerge, not just in services that were complementary to local telephony, but also with respect to local telephone service itself. The arrival of fiber optics fostered the emergence of a new type of company known as competitive access providers (CAPs). CAPs initially focused on offering long-distance bypass services, which allowed corporate customers to place long-distance telephone calls without having to access the Bell System's local telephone facilities. The eventual expansion of CAP networks to cover the entire core business districts of major metropolitan areas made it possible for CAPs to begin to offer local telephone service in direct competition with the incumbents.<sup>10</sup>

The first services provided by the new local competitors were not interconnected with the local telephone company and were exempt from state regulation because they were classified as interstate access. As the companies developed, they sought interconnection with local telephone companies, first to extend their private-line services to customers beyond their physical facilities and then to provide switched-telephone service. The incumbent local exchange carriers ("ILECs") generally refused the requests for interconnection or offered interconnection on terms considered onerous by the new competitive companies. The resulting disputes were adjudicated before the state regulatory commissions because the interconnection was required in order to expand their service offerings from interstate access to intrastate telephone service. Each state developed its own rules after conducting a formal hearing, but the issues and arguments were similar across states.

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<sup>8</sup> Brock, Gerald, "Interconnection Policy and Technological Progress," Federal Communications Law Journal, 58 Fed. Comm. L.J. 445, June, 2006, accessed at <http://www.law.indiana.edu/fclj/pubs/v58/no3/f-brock.pdf>

<sup>9</sup> Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat.56 to be codified at 47 U.S.C. Sec.151 et seq.

<sup>10</sup> Spulber, Daniel F. and Yoo, Christopher S., "Toward a Unified Theory of Access to Local Telephone Systems". Federal Communications Law Journal, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN: <http://ssrn.com/abstract=1408124>

The consent decree ordering the breakup of AT&T also required the local telephone companies to provide equal access to all long-distance and information service providers. The measures made no attempt to introduce competition into local telephony. Instead, they conceded that local telephone service remained a natural monopoly and attempted to foster competition in complementary services.

While the incipient local competitors were developing, the BOCs were seeking freedom from the divestiture restrictions. The divestiture theory required that the BOCs be restricted to providing natural monopoly local-exchange service and prohibited from providing potentially competitive services. The BOCs sought relief from the court, which retained oversight of the *MFJ* agreement, from the FCC, and from Congress. Beginning in 1986, several bills were introduced to relax or remove the restrictions from the BOCs, but they did not pass. In 1993, a bill was introduced to promote competition in the local exchange by creating a federal policy on interconnection to replace the emerging patchwork of state policies. The existence of some political support for freeing the BOCs of their restriction to "monopoly" local exchange service and of some political support for developing federal policies to further reduce the monopoly characteristics of local exchange service provided the opportunity for a political bargain, which combined elimination of the *MFJ* restrictions with policies designed to eliminate monopoly power in the local exchange.

The 1996 Act was designed to "open all communications services to competition," including local telephone service. The interconnection provisions of the 1996 Act were similar to the provisions developed by the state regulatory commissions that had earlier developed frameworks for local competition. The new interconnection provisions substantially strengthened the requirements of the Communications Act of 1934. The new law established a general duty for "each telecommunications carrier . . . to interconnect directly or indirectly with the facilities and equipment of other telecommunications carriers" instead of only requiring interconnection after a hearing that found such interconnection to be in the public interest. More specific requirements were imposed on incumbent local telephone companies ("ILECs"), including the requirement that reciprocal compensation for interconnecting carriers "provide for 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."<sup>11</sup> Such costs must be determined "on the basis of a reasonable approximation of the additional costs of terminating such calls," although carriers may waive mutual recovery in favor of other arrangements, such as "bill and keep" systems.

The interconnection provisions of the 1996 Act accelerated and standardized the interconnection arrangements that were being developed in the states at that time. The 1996 Act provided a general framework that was applicable to all states rather than leaving it to each state to develop its own framework, but the statutory framework left considerable freedom for the development of alternative interconnection arrangements. Thus, the practical effect of the federal interconnection requirements was to eliminate separate state policies over the general approach to local competition while retaining state regulatory control over the details of the

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<sup>11</sup> Brock, Gerald, "Interconnection Policy and Technological Progress," Federal Communications Law Journal, 58 Fed. Comm. L.J. 445, June, 2006, accessed at <http://www.law.indiana.edu/fclj/pubs/v58/no3/f-brock.pdf>

interconnection agreements. Because the details of the interconnection agreements were crucial to competitive viability, the state commissions retained considerable control over the competitive conditions within their state even after the 1996 Act preempted their control over the general policy toward local competition.<sup>12</sup>

#### 1.1.4 Intercarrier Compensation

There are three major types of “intercarrier” compensation; access charges, reciprocal compensation agreements, and customer-to-carrier payments. The first two are the most relevant here. Access charges are payments from a long-distance company to a local exchange telephone company for the origination or termination of long-distance traffic. Access charges are regulated and their structure, as well as the structure of intrastate access regulated by state regulatory commissions and interstate access regulated by the FCC is described in detail further on. . The access charge structure was implemented in 1984 after the divestiture of AT&T’s local exchange companies from the long-distance company. Access charges were initially designed to reproduce the revenue flows that resulted from pre-divestiture politically determined formulas for the reduction of long-distance revenue between AT&T’s long-distance division and local telephone companies. Those formulas included particularly favorable arrangements for independent rural telephone companies. The initial access charges required high payments to local carriers per minute of long-distance traffic originated or terminated, and while subsequent revisions greatly reduced the rates, access charges continued the pattern of providing a combination of actual cost recovery and subsidy. The entire system of access charges has also been made obsolescent by new technologies and business practices: for example, many cellular pricing plans do not distinguish between local and long-distance calling. Access charges were designed for a technology in which significant costs were incurred to carry telephone calls over long distances, but the costs of bulk transmission have declined so significantly that the cost of transmitting telephone calls may be considered largely distance insensitive.<sup>13</sup> Access charges were designed to keep long-distance charges to the consumer above the cost of providing service and to use the excess revenue to subsidize local exchange carriers through high charges for originating or terminating long-distance calls. But those implicit subsidies have been to some extent replaced by explicit subsidies paid through the Universal Service Fund.<sup>14</sup>

The current flow of intercarrier compensation payments – which some estimate at \$14 billion per year – reflects basic regulatory choices made around the time of the AT&T breakup and then in the passage of the 1996 Act. Under the dichotomous system in place today, a long distance carrier pays access charges to the local carriers on each end of a long distance call; and a local exchange carrier typically pays lower reciprocal compensation rates whenever it hands off local calls to be terminated on another carrier’s network. Each of these two schemes follows basic calling-network-pays principles, albeit in quite different ways. As explained below, competition and technological innovation have undermined the local/long distance distinction underlying these two schemes and, more generally have raised questions about the

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<sup>12</sup> Ibid.

<sup>13</sup> Brock, Gerald W. (2009). “*Unifying the Intercarrier Compensation Regime*,” in May, Randolph J., New Directions in Communications Policy, Durham: Carolina Academic Press., p. 127.

<sup>14</sup> Ibid.

long run utility of the “calling-network-pays” approach. Dissatisfaction with that approach has increased interest in the bill-and-keep alternative, which presents policy and legal questions of its own.

Regulators have traditionally viewed access charges – the fees that carriers impose for originating and terminating long distance calls – as a critical source of implicit subsidies for local telephone incumbents. As a result, the access charges collected by the local carrier at each end of a long distance call have traditionally exceeded any rigorous measure of the costs such carriers incur in handling those calls. That is particularly true of “intrastate” access charges set by state commissions: the fees that long distance carriers pay local carriers for handling calls that stay within a given state’s boundaries.

The small rural telephone companies and their subscribers depend heavily on above-cost access charges to subsidize low retail rates for their unusually high per-line costs. Under section 254(g) of the 1996 Act, the long distance carriers paying such charges cannot pass them back to the specific rural customers that “cause” them; instead, they must include them within the nationally averaged long distance rates they charge their customers throughout the United States.<sup>15</sup>

#### 1.1.4.1 Reciprocal Compensation

Interconnection access refers to reciprocal connections between two networks competing to offer similar services to the same customers as the network owner. It gives each provider the right to handoff traffic originating on its own network for termination on the other provider's network. It also obligates the provider to terminate traffic originating on the competitor's network. These mandated reciprocal connections combine the two smaller networks to form a larger network.<sup>16</sup>

Interconnection access arises any time two local telephone companies serve the same calling area. Because of the Bell System's strategy of either acquiring competing local systems or ceding the field to those competitors that refused to merge, Bell-owned local telephone companies rarely operated in the same calling areas as an independent local telephone company.<sup>17</sup>

Mandating interconnection access necessarily requires regulatory authorities to establish access prices. The 1996 Act requires local carriers to interconnect and to settle the charges through a system of mutual and reciprocal compensation, which the statute provided would be based on "a reasonable approximation of the additional costs of terminating such calls."

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<sup>15</sup> Nuechterlein, Jonathan E. and Weiser, Philip J. (2005). *Digital Crossroads: American Telecommunications Policy in the Internet Age*. Cambridge, MA: The MIT Press.

<sup>16</sup> Spulber, Daniel F. and Yoo, Christopher S., “*Toward a Unified Theory of Access to Local Telephone Systems*”. Federal Communications Law Journal, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN:

<http://ssrn.com/abstract=1408124>

<sup>17</sup> Ibid.

Regulators have also been experimenting with alternative institutional arrangements that obviate the need to set access rates altogether. The statute made clear that it did not preclude arrangements that waive mutual recovery, such as bill and keep. Indeed, local telephone companies serving the same area have long exchanged traffic on a bill and keep basis. The rationale is that the payments one network would receive for terminating traffic from the other network would be largely offset by the payments that network would have to pay for traffic passing in the opposite direction. Whatever slight differences in traffic there may be would not justify incurring the transaction costs needed to account for and bill the interchange of traffic.

The FCC recognized the potential benefits of such alternative institutional arrangements in its initial order implementing the 1996 Act. The emergence of competition in local telephone services made it inevitable that some calls would originate on one company's local telephone network and terminate on another's. Although both the originating and terminating carrier would incur costs, due to the fact that local telephone service in the United States operates on a "calling party pays" basis, only the originating carrier would receive any payment for the call.

#### 1.1.4.2 Access Charges

Economic theory has identified one way in which even last-mile providers without market power in the national market can nonetheless use their terminating access monopoly to harm competition. This market failure results from what is in essence a common pool problem stemming from the fact that the United States follows the practice that the calling party pays the long-distance carrier for the entirety of the long-distance call. Long-distance carriers are, of course, not the only carriers that incur costs when a customer places a long-distance call. The LEC for the party originating the call must incur costs to provide a connection between the customer's premises and the long-distance carrier's point of presence in the originating LEC's central office. Furthermore, the terminating LEC must also incur the cost of connecting the call from its central office to the customer premises of the party to whom the call is placed.

The calling party, either directly or indirectly through its long-distance carrier, is thus well situated to exert price discipline over originating access charges. The same is not true, however, for terminating access charges. Because neither the calling party nor its long-distance carrier has any influence over the called party's choice of LEC; neither can exert any price discipline over terminating access charges. Furthermore, the common pool aspect of the access charge regime means that LEC customers will not bear the full brunt of any increase in terminating access charges. Instead, the impact of the higher prices will be spread over the entire universe of local telephone subscribers. This, in turn, gives terminating LECs both the ability and the incentive to raise terminating access charges above competitive levels in order to draw a disproportionate amount of compensation out of the common pool. The impetus to increase terminating access charges exists regardless of whether competition in local access exists or the terminating LEC is small. Indeed, small carriers may well have the greatest incentive to increase terminating access charges because the percentage of the increase to their own customers will be disproportionately small.

### 1.1.5 Role of State Regulation

Under the system of federalism enshrined in the U.S. Constitution, the authority of the federal government is limited to *interstate* commercial activities. The regulation of *intrastate* telephone rates falls within the jurisdiction of the states. Although early legislation in five states had authorized some degree of regulation over local telephone companies, state regulation of local telephone service did not begin in earnest until 1907 when states began authorizing their public utility commissions to oversee the reasonableness of local telephone rates. By 1921, all but three states had instituted some form of regulation of local telephone rates.<sup>18</sup>

Since the enactment of the Communications Act of 1934, federal telecommunications law has emphasized that state agencies must be permitted to regulate "intrastate" telecommunications services. To limit the scope of federal authority, the 1934 Act instituted the "separations" model, under which states are free to regulate the so-called "intrastate" aspects of communications unless it would be "impossible" to separate those aspects from interstate services. From 1934 to 1996, regulatory agencies and the courts frequently considered where to draw the line between federal and state authority, with the United States Supreme Court ultimately setting forth the logic and requirements of the separations model in 1986 in *Louisiana PSC v. FCC*. In so doing, the Court recognized that the 1934 Act's regime was unstable, noting "while the Act would seem to divide the world of domestic telephone service neatly into two hemispheres ... in practice, the realities of technology and economics belie such a clean parceling of responsibility."

In the 1996 Act, Congress did not address clearly the jurisdictional relationship between federal and state authority, leading to a round of litigation as to whether the classic model of separated authority applied to the initiative of promoting local competition through the regulation of interconnection and wholesale markets. In *AT&T v. Iowa Utilities Board*, the Supreme Court made clear that the 1996 Act's new requirements followed what is generally referred to as "cooperative federalism." Nonetheless, the 1996 Act left in place a rule allowing state agencies to maintain complete control over "intrastate" services. This regime, as the Supreme Court's *Louisiana PSC* decision anticipated, has faced constant pressure from a dynamic marketplace whose services increasingly do not follow geographic boundaries.

Multiple technological trends are eroding the once clear distinction between local and long distance services: the cost of communicating is becoming more distance insensitive; geographic boundaries are irrelevant to emerging technology; intelligence and functions are migrating away from the central office (the delocalization of the central office); the relevant networks as well as the services that ride on these networks are increasingly comprised of numerous component parts (e.g., those offered by different providers); packet-routed networks are becoming more prevalent than circuit-switched networks; and the application (e.g., voice) is becoming more independent and separate from the network.

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<sup>18</sup> Spulber, Daniel F. and Yoo, Christopher S., "Toward a Unified Theory of Access to Local Telephone Systems". *Federal Communications Law Journal*, Vol. 61, p. 43, 2008; U of Penn, Inst for Law & Econ Research Paper No. 09-18; U of Penn Law School, Public Law Research Paper No. 09-14. Available at SSRN: <http://ssrn.com/abstract=1408124>

In sum, the ability to regulate intrastate services distinctly from interstate ones is increasingly difficult to sustain with respect to digital age communications networks, which increasingly revolve around the Internet and wireless technologies. As the FCC stated in concluding that Vonage's Voice over Internet Protocol offering was subject to federal jurisdiction, communications services are increasingly "designed to overcome geography, not track it" (See Sec. 2.5.3).

## 1.2 The Federal Communications Commission

### 1.2.1 Intercarrier Compensation: The First Report and Order

Following passage of the Telecommunications Act, the Federal Communications Commission promptly responded to the new legislative mandate. On August 8, 1996 it issued its "First Report and Order" implementing the 1996 Act. It succinctly summarized the goals of the 1996 Act in its Executive Summary:

*"Three principal goals established by the telephony provisions of the 1996 Act are: (1) opening the local exchange and exchange access markets to competitive entry; (2) promoting increased competition in telecommunications markets that are already open to competition, including the long distance services market; and (3) reforming our system of universal service so that universal service is preserved and advanced as the local exchange and exchange access markets move from monopoly to competition. In this rulemaking and related proceedings, we are taking the steps that will achieve the pro-competitive, deregulatory goals of the 1996 Act. The Act directs us and our state colleagues to remove not only statutory and regulatory impediments to competition, but economic and operational impediments as well. We are directed to remove these impediments to competition in all telecommunications markets, while also preserving and advancing universal service in a manner fully consistent with competition."*<sup>19</sup>

According to the Report, the rules adopted by the Commission to implement the local competition provisions of the 1996 Act represent only one part of a trilogy. "In this Report and Order, we adopt initial rules designed to accomplish the first of the goals outlined above – opening the local exchange access markets to competition. . . . The second part of the trilogy is universal service reform. Universal service reform is vitally connected to the local competition rules we adopt today. . . . The third part of the trilogy is access charge reform. It is widely recognized that, because a competitive market drives prices to cost, a system of charges which includes non-cost based components is inherently unstable and unsustainable. It is also well-recognized that access charge reform is intensely interrelated with the local competition rules of section 251 and the reform of universal service."<sup>20</sup>

Thus from the very beginning it has been apparent that three themes are inextricably interwoven: competition, universal service and access charges. From that time until the present has been an extended process of working out the details of how they relate. The FCC has subsequently

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<sup>19</sup> Federal Communications Commission, FCC 96-325, First Report and Order: CC Docket No. 96-98 and CC Docket No. 95-185 August 1, 1996, p. 7.

<sup>20</sup> Ibid.

instituted numerous proceedings aimed at further addressing an orderly transition from monopoly to a more competitive environment.

Pursuant to the Telecommunications Act, the FCC undertook a program of reform of both interstate access charges and federal universal service support mechanisms. Beginning in 1997, the FCC adopted several measures to move interstate access charges for price cap carriers toward lower, cost-based levels by revising the recovery of loop and other non-traffic sensitive costs from per-minute charges to flat per line charges, thereby aligning rates more closely with the way the costs are incurred. The FCC held that more rate structure modifications would be required to create a system that accurately reflects the true cost of service in all respects. The FCC believes the market-based approach, in which competitive forces primarily drive access charges down to cost-based levels, would serve the public interest better than regulatory-prescribed rates.

In its *Interstate Access Support Order* the FCC continued the process of access charge and universal service reform for price cap local exchange carriers. The FCC also revisited the controversial "X-factor," in the federal price cap mechanism changing its function from a productivity offset to a tool for reducing per-minute access charges to target levels proposed by parties participating before the federal agency. The FCC also established a new interstate access support mechanism, capped at \$650 million annually, to replace what the FCC deemed implicit support included in the interstate access charges of price cap carriers, finding \$650 million to be a reasonable amount that would provide sufficient, but not excessive, support. In this regard, the FCC observed that a range of funding levels might be deemed "sufficient" for purposes of the 1996 Act, and that "identifying an amount of implicit support in our interstate access charge system to make explicit is an imprecise exercise." The FCC noted that more rate structure modifications would be required to create a system that accurately reflects the true cost of service in all respects.

In recognition of the need for a more comprehensive review of the issues of access charge and universal service reform for the remaining 1,300 or so rural carriers serving less than 2% of the nation's access lines, the FCC placed such reforms for the non-price cap carriers on a separate track. As documented in a series of white papers prepared by the Rural Task Force, which was constituted by the FCC to study the differences between the provision of telecommunications services in rural and non-rural areas, rural carriers generally have higher operating and facilities costs due to lower subscriber density, smaller exchanges and limited economies of scale. Significantly, rural carriers rely more heavily on revenues from access charges and universal service support in order to provide ubiquitous and affordable local service.

### 1.2.2 The Rural Task Force Order

On May 23, 2001, the FCC released its *Fourteenth Report and Order and Twenty-Second Order on Reconsideration, and Further Notice of Proposed Rulemaking, Multi-Association Group (MAG) Plan for Regulation of Interstate Services of Non-Price Cap Incumbent Local Exchange Carriers and Interexchange Carriers*, CC Docket No. 00-256, Report and Order, 16 FCC RCD 11244 (released May 23, 2001) ("Rural Task Force Order").

The *Rural Task Force Order* changed the manner in which rural interstate universal service support is currently calculated and applied. Among other things, it endorsed use of a modified embedded cost mechanism for rural carriers, as opposed to a forward-looking cost mechanism required for price cap carriers, to determine rural carrier support, and included implementation of a rural growth factor (the sum of annual line growth and a general inflation factor) and a safety net additive and safety valve to provide support for new investment and growth above stated thresholds.

Having taken major steps in beginning to reform interstate high-cost support, interstate access charges and universal service support systems for non-rural carriers through a series of reports and orders in the matter of *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45 and the *Interstate Access Support Order*, and the interstate high-cost support for rural carriers through the *Rural Task Force Order*, the FCC began to address the matter of interstate access charge and universal service support reforms for rural carriers. On November 8, 2001, the FCC issued its *Second Report and Order* at CC Docket Nos. 01-304, 00-256 (MAG Plan), 96-45 (USF), 98-77 (Access Charge Reform) and 98-166 (Authorized ROR), in what is referred to as the MAG Order.

In the *MAG Order*, the FCC stated its intent to align the interstate access rate structure with a lower, more cost-based level, remove what the FCC deemed to be implicit support for universal service and replace it with explicit, portable and competitively neutral support. In addition, subscriber line charges (SLC) caps were increased effective January 1, 2002, raising monthly per line rates from \$3.50 to \$5.00 for residence and single line business, and from \$6.00 and \$6.50, respectively.

### 1.2.3 The “Missoula Plan”

On July 24, 2006, the National Association of Regulatory Utility Commissioners' Task Force on Intercarrier Compensation submitted an intercarrier compensation reform plan, known as the "Missoula Plan," to the FCC for consideration. The Missoula Plan was an industry proposal for intercarrier compensation reform. While NARUC acted as a facilitator, state Commissions were not part of the negotiations process. Supporters of the Plan include AT&T, BellSouth Corp., Cingular Wireless, Global Crossing, Level 3 Communications and 336 members of the Rural Alliance, and many others.<sup>21</sup>

The Missoula Plan was a multi-year plan that unifies intercarrier charges for the majority of lines, and moves all intercarrier rates charged for all traffic closer together. The Plan proposed to reduce the highest intercarrier compensation rates and provides opportunity for the carriers to recover lost intercarrier compensation revenues through supplemental sources of recovery to make carriers whole. However, the Plan ensured that certain rural carriers would not be required to reduce their intrastate access charges below their current rate levels for interstate access charges. For the most part, network cost recovery was shifted from intercarrier charges to a combination of (1) higher end user subscriber line charges (SLCs) (2) a new "Restructure

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<sup>21</sup> Public Utilities Commission, California, “*Brief Summary of Missoula Plan*,” October 5, 2006, accessed at <http://docs.cpuc.ca.gov/published/Report/60558.htm>

Mechanism" (RM), designed to replace the intercarrier revenues lost by carriers not otherwise recovered through increased Subscriber Line Charge (SLC) rates.

The Plan's reductions to intercarrier rates and increases in SLC charges would be transitioned in over a six-year period, although most of the revenue shift occurs in the first three years. The Plan refers to these years as "Steps", with Step 1 beginning on day one of the Plan implementation. The Plan increases SLCs and federal surcharges as well as other USF revenue funding mechanisms, some of which may be unrelated to lost revenues to fund the RM and to unify intercarrier rates.

The Plan proposed an increase in federal universal support of \$2.25 billion, which would have represented a 32% increase over the existing USF fund of \$7 billion. In addition, although carriers would receive RM funding to compensate for any lost revenues, the Plan did not mandate any cost-saving flow-through by carriers to their customers.<sup>22</sup>

The Plan was not approved, but the discussion continues as part of an open FCC docket, Developing a Unified Intercarrier Compensation Regime, CC Docket No. 01-92

#### 1.2.4 Proposals for Reform

On November 5, 2008, at CC Docket No. 01-92, the FCC issued a pending *Intercarrier Compensation Notice of Proposed Rulemaking* ("ICC NOPR") which considered a substantial restructuring of the intercarrier compensation system and federal USF was proposed by former FCC Chairman Martin. The plan included the concept of subjecting all traffic to a new reciprocal compensation methodology designed to drive down interstate and intrastate access rates and to be implemented by state regulators. The plan further proposed to raise the cap on the national subscriber line charge up to \$8.00--\$8.50 per month from the current \$6.50 level. Chairman Martin's draft was released at CC Docket No. 01-92 as a Notice of Proposed Rulemaking and appeared in the *Federal Register* on November 10, 2008.

This proposal, which was not adopted, raised a number of concerns, in particular among consumer groups, which questioned how the FCC would move away from the complicated menu of access charges and shift toward uniform rates. Because the new rates would be lower than what some phone companies generally receive now, those companies could recover at least part of their lost revenue -- \$4 billion industry wide -- by increasing fees on consumer phone bills, including "subscriber line charges." Under this plan, consumers who live in rural areas could see some of the biggest phone bill increases since rural phone companies would have more lost access revenue to recover, according to Ben Scott, policy director for the advocacy group Free Press. Scott, however, also noted that he would not rule out supporting Martin's proposals -- even if consumer phone bills increase -- as long as the result is reasonable high-speed internet for the entire country.<sup>23</sup>

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<sup>22</sup> Public Utilities Commission, California, "Brief Summary of Missoula Plan," October 5, 2006, accessed at <http://docs.cpuc.ca.gov/published/Report/60558.htm>

<sup>23</sup> Tessler, Joelle, "FCC Overhaul Eyes Broadband but Could Raise Bills," USA Today Online, Oct. 15, 2008 accessed at [http://www.usatoday.com/tech/products/2008-10-15-3014682722\\_x.htm](http://www.usatoday.com/tech/products/2008-10-15-3014682722_x.htm)

The FCC has recognized in prior rulemaking proceedings that, to the extent possible, costs of interstate access should be recovered in the same way that they are incurred, consistent with principles of cost-causation. Thus, the cost of traffic-sensitive access services should be recovered through corresponding per-minute access rates. Similarly, non-traffic sensitive (NTS) costs should be recovered through fixed, flat- rated fees. The FCC, however, has not always adopted rules that are consistent with this goal. In particular, the FCC has limited the amount of the allocated interstate cost of a local loop that is assessed to residential and business customers as a flat monthly charge, because of concerns that allowing higher flat charges might cause customers to disconnect their telephone service. The residual cost of the loop, not recovered from end users through the flat charge, is to be recovered through a per-minute-of-use charge assessed to long-distance carriers.

Because these access pricing rules do not accurately reflect the underlying cost of providing access service, they embody an implicit subsidy. Some of these subsidies are due to the rate structures prescribed by FCC and Commission rules, which in some cases prevent ILECs from recovering their access costs in the same way they have been incurred. For example, although the cost of the local loop that connects an end user to the telephone company's switch does not vary with usage, current access charges levied by ILECs recover a large portion of these non-traffic-sensitive ("NTS") costs through traffic-sensitive, per-minute charges. Because these charges are passed on by IXCs to their customers, the effect is that persons who make many long-distance calls pay for a greater proportion of these NTS costs than those who do not make many long distance calls.

Conversely, where rates are subsidized (as in the case of consumers in high-cost areas), rates will be set too low and an otherwise efficient provider would have no incentive to enter the market. In either case, the total cost of telecommunications services will not be as low as it would otherwise be in a competitive market. As the Commission recognized in its Universal Service Order of January 28, 1997, access charges must be closer in magnitude to access costs for there to be true competition in the toll market.

The FCC has thus proposed, in broad terms, to formulate a new, "unified" regime for intercarrier compensation. The ultimate objective of this multi-year, politically fraught project is to apply the same internally consistent set of compensation principles across the board for any handoff of telecommunications traffic from one carrier to another, irrespective of the legacy classification of the carriers at issue or the technology used to deliver the call. For these purposes, the FCC has excluded as beyond the scope of its inquiry the exchange of traffic between Internet backbone providers, in what are called "peering" and "transiting" arrangements.<sup>24</sup>

For the purposes of providing the record of the FCC's proceedings in this area, it maintains on its website several pages with extensive links to the relevant documents, presented chronologically.<sup>25</sup>

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<sup>24</sup> Nuechterlein, Jonathan E. and Weiser, Philip J. (2005). Digital Crossroads: American Telecommunications Policy in the Internet Age. Cambridge, MA: The MIT Press, p.309.

<sup>25</sup> Federal Communications Commission, "*Inter-carrier Compensation*", undated, accessed at <http://fcc.gov/wcb/ppd/Inter-carrierCompensation/>; Federal Communications Commission, "*Inter-carrier*

### 1.3 Intrastate Access and Rural Telcos: Evolution

Many small independent telcos are still heavily dependent on access revenues, which they collect from other carriers for connecting calls to and from their customers. This was one of several key findings of a study of independent telcos reported in 2009 by the Telergee Alliance, a network of seven certified public accounting firms with telecom specialties.

For calendar year 2008, the median percentage of total operating revenues comprised of interstate access revenues was 36.6% for the 196 respondents, while intrastate access comprised a median 11.1% of total operating revenues. Interstate access minutes declined a median of 7.7%, while intrastate access minutes declined a median of 10.8%, the study found.

“The decline in access minutes reflects the fact that access lines are down,” explained Rod Ballard, a principal with Jackson Thornton, a Telergee member firm. “They’ve been decreasing over the last 10 years as population is moving out of rural areas. There are also some losses to VoIP. On top of that, the younger generation is more email-driven. They say, ‘Why call when I can Facebook somebody?’” A decline in per-minute revenues also contributed to lower access revenues overall. “That’s going down as clients negotiate new intercarrier compensation agreements,” Ballard said. “Access charges that used to be three to nine cents per minute now may be down to a penny.”

The existing intercarrier compensation system has led to significant instability and uncertainty regarding this revenue stream, which has raised questions about rural carriers’ ability to continue upgrading their networks to bring an evolving level of service to their customers. According to the Organization for the Promotion and Advancement of Small Telecommunications Companies (OPASTCO), a sufficient, predictable recovery of network costs helps enable the availability of services and rates for rural residents that are reasonably comparable to those available in urban areas.

According to OPASTCO:

*“any comprehensive intercarrier compensation reform will necessitate the unification of each rural ILEC’s interstate and intrastate access rates in order to eliminate the existing disparity between these rates, as well as uniform rules for interconnection. These reforms would minimize arbitrage opportunities, alleviate regulatory uncertainty, and help mitigate the incentives for phantom traffic. As a result, carriers would be able to focus greater resources on serving consumers. However, to ensure that intercarrier compensation reform is beneficial to the customers of small, rural ILECs, it is essential that these carriers be able to fully recover the revenues that are lost as a result of mandated reductions in access rates. This can be accomplished, in significant part, by the establishment of a ‘Restructure*

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*Compensation Proceedings*,” undated, accessed at <http://fcc.gov/wcb/ppd/InterCarrierCompensation/proceedings.html/>; Federal Communications Commission, “*InterCarrier Compensation History*,” undated, accessed at <http://fcc.gov/wcb/ppd/InterCarrierCompensation/history.html/>

*Mechanism' designed specifically for the replacement of reduced intercarrier compensation revenues not otherwise recovered through reasonable end-user charges."*<sup>26</sup>

The high-cost characteristics of the areas served by rural ILECs cause them to have per-subscriber costs that are significantly greater than the costs of urban-based carriers. A larger percentage of those costs are presently recovered through intercarrier compensation. Therefore, a Restructure Mechanism is critical to providing rural ILECs with the revenue stability necessary to continue investing in their networks, without having to seek substantial and unaffordable increases in end-user rates to offset access revenue reductions.

### 1.3.1 Rural Carrier Cost Variables

Companies operating in primarily rural areas face numerous differences from non-rural companies, including factors such as the scope of services offered, size, the geographic dispersion of customers and physical terrain. These unique circumstances often make rural carriers' cost of providing both standard voice service and advanced services higher than non-rural providers.

For example, rural carriers serve only eight percent of the nation's access lines, but these service areas are spread out over 38 percent of the nation's land mass. Nationally, the population density in areas served by rural carriers is only about 13 people per square mile. This compares to a national average population density of 105 persons per square mile in areas served by non-rural carriers. These differences lead to significant gaps between the abilities of large and small carriers to achieve economies of scale and scope.

Other characteristics that differentiate rural carriers from large carriers and make the provision of service more costly include:

- Higher local line costs due to longer lines and the remoteness of the areas that they serve.
- Higher unit costs for switching equipment due to smaller and more geographically dispersed subscriber populations that offer a limited volume of telephone traffic
- Average income in rural service areas is twenty percent lower than in areas served by larger carriers.
- Higher proportion of residential versus business subscribers.

When taken together, these factors lead to significantly higher costs to provide service on a per customer (line) basis for small, rural companies than for large companies. A study conducted for the federal government shows that, on average, the total investment per "loop," or line, is more than \$5,000 for rural companies compared to less than \$3,000 for non-rural companies. The actual difference can be much higher for individual companies. Toll access charges are one of the most significant sources of revenues that companies use to keep prices affordable and provide advanced services.

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<sup>26</sup> OPASTCO, "Action Item: Intercarrier Compensation," 2009 Legislative Regulatory Conference, undated, accessed at [www.opastco.org/doclibrary/1832/Final%20-%20L&R-2009-IntercarrierComp.pdf](http://www.opastco.org/doclibrary/1832/Final%20-%20L&R-2009-IntercarrierComp.pdf)

One way to close the gap between large and small provider intrastate access rates is by restructuring the way small companies recover their network costs. For example, in Michigan, such a proposed restructuring mechanism — which will act as an independently operated system — will require the participation of all providers but will limit reimbursements to only those providers that have traditionally been responsible for delivering telephone service to customers when no other providers are present. However, even providers eligible for reimbursements will face limitations on how much they can recover based on how their monthly prices compare to a statewide benchmark price.

### 1.3.2 The Issue of Subsidies

Small telecom companies provide service in some of the most remote areas. The history of these companies is that they were founded by local residents because other providers chose not to serve high-cost rural territories. Even in rural communities where wireless may be a substitute for standard voice service, it can't entirely take the place of landline broadband service that small companies have deployed to virtually their entire customer bases.

Some might argue that if rural customers can't switch to wireless to avoid large price increases, that's the price they pay for living in remote areas. Setting aside the fact that the intrastate access rates charged by small companies to large companies are intended to compensate the small companies for their investments, the "too bad" argument has some potentially serious drawbacks. Most importantly, rural customers have the same right to access accurate and reliable 911 service that non-rural customers enjoy. Today, they have that with their landline phones. If they're forced to switch to a lower quality, less reliable product, they'll be stuck with 911 locating technology that is far inferior to landline capabilities. Worse yet, if they can't afford the wireless plans being offered in rural areas, they may not have access to 911 service at all.

Rural carriers provide well paying jobs to local workers. These workers live and work in the communities they serve. Their tax dollars support state and local services and their support for community and charitable organizations enriches the quality of life. If the access revenues that small companies use to serve rural communities are eliminated without creating a restructuring mechanism, it is argued, jobs will be at risk.

### 1.3.3 Towards a Unified Intercarrier Compensation Regime

According to a Congressional Research Study by Charles Goldfarb, the “access charges” that some rural local exchange carriers charge long distance carriers for originating the long distance calls made by customers located in those rural areas, or for terminating the long distance calls made to customers located in those rural areas, exceed the nationally averaged price that the long distance carriers charge their subscribers for those calls, and thus the long distance carriers lose money on each long distance call into or out of those rural exchanges.<sup>27</sup>

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<sup>27</sup> Goldfarb, Charles, “*Telecommunications Act: Competition, Innovation, and Reform*,” CRS Report for Congress, Congressional Research Service, The Library of Service, Updated January 13, 2006, accessed at <http://net.educause.edu/ir/library/pdf/EPO0635.pdf>, p. 51.

As shown in Figure 1, a chart prepared by the Intercarrier Compensation Forum (“ICF”), today the *average* intercarrier compensation rate ranges from 0.1 cents per minute for traffic bound to an ISP to 5.1 cents per minute for intrastate traffic bound to a subscriber of a small (rural) incumbent local exchange carrier; individual rates can be as low as zero and as high as 35.9 cents per minute. These intercarrier compensation charges can represent a substantial portion of the costs of providing certain services and, in the case of long distance calls that interexchange carriers are required by statute and FCC rule to offer at a single rate nationally can exceed the retail price for the service.<sup>28</sup>

	Inter-carrier Compensation rate (cents/min)		
	Average	High	Low
Large ILEC interstate	0.6	1.5	0.5
Small ILEC interstate	1.8	8.9	0.3
Large ILEC intrastate	2.5	9.9	0.4
Small ILEC intrastate	5.1	34.9	0.7
CLEC interstate	1.8	6.8	0.2
CLEC intrastate	3.0	35.9	0.4
RC non-ISP bound	0.2	0.3	0.0
RC ISP bound	0.1	0.1	0.0
CMRS to ILEC inter-MTA	0.6	8.9	0.2
CMRS to ILEC intra-MTA	0.2	0.3	0.0

Table 1.1 Intercarrier Compensation Rates  
**Source:** Intercarrier Compensation Forum

Further, according to the same CRS study, in some quarters there is resistance to comprehensive intercarrier compensation reform because of concerns that some carriers and some consumers may be harmed by the changes. In this view: If the access charges currently imposed by local exchange carriers on interexchange carriers to originate and terminate long distance calls were reformed to more accurately reflect the low proportion of switching costs that appear to be usage-sensitive (and the high proportion that appear to be fixed), per-minute access charges imposed on the long distance carriers would fall, but the fixed costs of switching would likely be recovered by raising the subscriber line charge imposed on end users for connecting to the network. Consumer groups have consistently opposed line charges of any sort, arguing that such charges unfairly burden low usage and low income customers.

Also, the rural carriers’ local calling areas tend to be narrowly defined and to serve only a small number of households. Many of their customers’ incoming and outgoing calls therefore are

<sup>28</sup> Ibid.

classified as toll (long distance) calls, for which the rural LECs receive above-cost minute-of-use access charges from long distance carriers, rather than the fixed end-user charge typical of local service. As a result, the small rural LECs historically have generated a much larger portion of their total revenues from access charges than have urban LECs.<sup>29</sup>

Since the access charges of rural LECs exceed costs by more than those of urban LECs, and since rural LECs have depended on access charges more than urban LECs, reforming access charges to bring them down to cost would place a greater revenue burden on rural LECs than on urban LECs. Absent another revenue source, end-user line charges would have to be raised more in rural areas than in urban areas. To keep line charges from growing to the point where local service becomes unaffordable or non-comparable with urban rates, some argue that a new universal service funding mechanism is needed to replace the implicit universal service funding currently in the rural carriers' access charges. Others have sought alternative approaches.

Although all the proposals for intercarrier compensation reform have included new universal service funding mechanisms, the rural LECs prefer not to have to rely so heavily on an explicit universal service funding mechanism. They generally prefer to have three revenue sources — line charges, universal service funds, and above-cost access charges — rather than just the first two. In part, this is because they prefer to recover a larger portion of their costs from long distance carriers (whose averaged rates subsidize rural customers) than from their own end-user customers in subscriber line charges. And in part it is because they are concerned about relying too heavily on universal service funds, which they consider a potentially unstable source of revenue, especially now that rural wireless carriers are seeking these same universal service funds.<sup>30</sup>

In his report, Goldfarb addresses several ways to hold down the cost of the universal service fund. One of the alternatives relates to access charges. It is to continue to fund universal service in part by allowing rural carriers to set above-cost intercarrier compensation rates as a way to maintain lower local rates. These rural LECs would prefer to be able to ensure an internal funding source by maintaining above-cost rates for originating or terminating certain traffic where the other carrier involved with the call is a captive customer. This, however, would maintain the market distortions that exist today and hamper competition.<sup>31</sup>

## 1.4 Pennsylvania Access Charge History

### 1.4.1 PA Chapter 30

Pennsylvania made a major statement in setting its overall policy towards telecommunications in the Commonwealth when it passed Chapter 30 to the Pennsylvania Public Utility Code in 1993. The first clause of the first sentence of Chapter 30 states that: “The General Assembly finds and declares that it is the policy of this Commonwealth to: (1) Maintain universal telecommunications service at affordable rates . . .”

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<sup>29</sup> Ibid, p. 56.

<sup>30</sup> Ibid., p. 57

<sup>31</sup> Ibid, p. 67

Subsequently, House Bill 30 was signed into law on Nov. 30, 2004 as Act 183<sup>32</sup>, and took effect on Dec. 1. Act 183 enacted an amended version of the original Chapter 30, which authorized the Commission to permit a reduced, alternative form of regulation for incumbent local exchange carriers (ILECs) which promised broadband (BB) deployment by 2015. All Pennsylvania ILECs have adopted network modernization plans (NMPs) that will provide universal BB availability at a minimum bandwidth of 1.54 Mbps (megabits per second) - in at least one direction, reasonably deployed among urban, suburban and rural areas by 2015 or before. The new legislation seeks to encourage earlier completion of these existing NMPs by providing the ILECs with more economic incentives and less Public Utility Commission (PUC) regulation.<sup>33</sup>

The key provisions are as follows: continuity of existing PUC-approved alternative regulation (in the form of price cap regulation) and NMPs to provide BB to all customers by 2015; options to encourage rural and non-rural ILECs to complete their NMPs earlier than 2015 by offering reduction or elimination of the productivity offset; new limits on Commission-mandated general filing requirements; streamlined procedures for declaration of competitive services; no sunset provision in Act 183.

The legislation includes definitions providing for broadband speeds and availability, jurisdictional entities and rural and non-rural ILECs. There is no definition of or provisions to regulate Voice over Internet Protocol (VoIP). Act 183 provides that all existing alternative regulation plans and NMPs are continued. At the same time, section 3013 permits ILECs to file amended NMPs in order to obtain the economic incentives delineated in the new law – reduction or elimination of the productivity offset. In addition, section 3013 permits all services previously found competitive to remain so unless reclassified by the Commission under section 3016 of the Act.<sup>34</sup>

Regarding the financial incentives contained in the legislation, section 3015 requires that a reduction of an ILEC's current productivity offset (PO) occurs upon the filing of an amended NMP and not after the PUC's review process of an ILEC's amendment.

In addition, subsection (B) provides that the several small rural ILECs without a price stability mechanism are permitted tariff changes, on 45 days notice, to increase rates, excluding basic residential and business rates, up to 3 percent of the carrier's intrastate revenues annually. The legislation also provides for the PUC to enforce a refund mechanism of the modified offset.

In regard to access charges, the legislation limits the PUC's authority to order access charge reductions except on a revenue neutral basis. The provision limits the PUC's ability to order access charge reductions unless balanced by increases to local exchange rates.<sup>35</sup>

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<sup>32</sup> AllBusiness, "Pennsylvania Governor Enacts Revised Chapter 30," Business Wire, December 1, 2004, accessed at <http://www.allbusiness.com/government/government-procedure-lawmaking-legislation/5597735-1.html>

<sup>33</sup> Pennsylvania Public Utility Commission, "New Chapter 30 Legislation Takes Effect," Keystone Competition, Winter 2005.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid

## 1.4.2 Subsequent Proceedings

By Opinion and Order entered February 14, 1997, at Docket No. I-00960066, the Commission initiated a “separate generic investigation to examine the costs and pricing structure of intrastate access charges.” This case grew out of the PUC’s January 28, 1997 Order at Docket No. I-00940035 in which it initially examined, as part of its Universal Service Investigation, a number of issues concerning intrastate carrier access charges. Soon after the briefs were filed, on November 10, 1997, BA-PA and the smaller rural Pennsylvania local exchange carriers filed with the Commission for review and approval, a Joint Petition In Settlement of the Generic Access Charge Investigation and three (3) other proceedings. The Joint Petition In Settlement filed November 10, 1997, was the forerunner of the “Small Company Universal Service Fund Settlement Plan”. The Small Company Universal Service Fund Settlement Plan incorporates provisions that largely incorporate the determinations of various previous developments.

On June 30, 1998, Administrative Law judge Michael C. Schnierle released his “Recommended Decision”. As he did so, he noted, “The subject of this proceeding, telephone company access charges and their relationship to universal service, is arcane, to say the least.” He then reviewed the history.<sup>36</sup>

When AT&T was the only long-distance carrier, there was no formal system of tariffed charges to determine how its subsidiaries, the local Bell Operating Companies (“BOCs”), and the hundreds of unaffiliated, independent LECs would recover the costs allocated to the interstate jurisdiction by the separations rules. Instead, AT&T remitted to these companies the amounts necessary to recover their allocated interstate costs, including a return on allocated capital investment.

In 1983, following the decision to break-up AT&T, the FCC adopted uniform access charge rules in lieu of earlier agreements. These rules governed the provision of interstate access services by all incumbent LECs, BOCs as well as independents. The access charge rules provide for the recovery of the incumbent LECs’ costs assigned to the interstate jurisdiction by the separations rules. The PA PUC similarly authorized Pennsylvania LECs to collect access charges for intrastate toll calls. Determining the costs that an incumbent LEC (ILEC) incurs to provide interstate access services and that, consequently, should be recovered from those services, he noted, is relatively straightforward in some cases and problematic in others.

Despite the existence of distortions and inefficiencies, this system of cross-subsidies has been justified on policy grounds, principally as a means to serve universal service goals. By providing ILECs with a stream of subsidized revenues from certain customers, the system has allowed regulators to demand below-cost rates for other customers, such as basic telephone service for those customers in high-cost areas. For all intents and purposes, he said, the system serves as a hidden tax collected by the telephone companies. Low cost telephone customers are required to pay more than they would have to pay in a competitive market, to allow the telephone companies to charge less to customers whose cost of service would otherwise be higher.

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<sup>36</sup> Schnierle, Michael, ALJ, “*Recommended Decision*,” Generic Investigation of Intrastate Access Charge Reform, Docket No. I-00960066, Before the Pennsylvania Public Utilities Commission, June 30, 1998.

The existing system (of implicit subsidies and support flows) is sustainable only in a monopoly environment, he continued, where ILECs are guaranteed an opportunity to earn returns from certain services and customers that are sufficient to support the high cost of providing other services to other customers. The new competitive environment envisioned by the 1996 Act threatens to undermine this structure over the long run. The 1996 Act removed barriers to entry in the local market, generating competitive pressures that make it difficult for ILECs to maintain access charges above economic cost. ILECs are likely to be forced to lower their access charges or lose market share, in either case jeopardizing the source of revenue that, in the past, has permitted the ILEC to offer service to other customers, particularly those in high-cost areas, at below-cost prices.

In support of this assertion, he directed attention to the Bell Atlantic-PA Cross Examination Exhibit 11, which shows the weighted one-party residential rate excluding the federal Subscriber Line Charge ("SLC") for each Pennsylvania ILEC, other than BA-PA. It also shows the average intrastate common carrier line charge (CCLC - an access charge element) revenue per month for each of those LECs. The exhibit reflects that many small Pennsylvania ILECs collect as much or more per month from the intrastate CCLC than they collect from the average one party residential rate. The customers of those companies who use much toll service are paying for a greater share of the cost of the network than those customers who use little or no toll service.

On its face, the access charge situation would seem to have three solutions. One solution is to rebalance rates so that more loop costs are recovered through fixed charges levied either upon IXCs or on end users. A second solution is to lower access charges and offset the lost revenue with payments from a universal service fund. A third solution would be a combination of the first two. There are, however, other aspects to the problem.

The FCC has recognized in prior rulemaking proceedings that, to the extent possible, costs of interstate access should be recovered in the same way that they are incurred, consistent with principles of cost-causation. Thus, the cost of traffic-sensitive access services should be recovered through corresponding per-minute access rates. Similarly, non-traffic sensitive (NTS) costs should be recovered through fixed, flat-rated fees.

As noted by the Commission at page 103 of its Order of January 28, 1997, in 1983, the Commission ordered all Pennsylvania LECs to "mirror" their interstate access charges for intrastate purposes. In a final order at Docket No. P-00830452, entered August 9, 1985, the Commission reaffirmed its requirement to mirror the interstate access charges, and ordered the independent LECs to use Bell's then effective common carrier line ("CCLC") rate of \$.0471 per minute of use ("MOU"). The CCLC is one element of the typical access charge tariff. Since then, each company has proceeded differently in pricing access.

Access reform started in September 1999 when the Commission first recognized that implicit subsidies in access rates must be reduced and/or eliminated (this was a part of the 1999 Global Order). [More on the "Global Order" below] At that time, access rates of both Verizon and the rural ILECs were reduced slightly (rural LEC access reductions were offset by modest local rate increases and the creation of a USF). In 1999, the Commission promised that further access

reductions would occur by 2001, although the Commission did not adhere to that schedule. After 1999, access reform diverged into 2 tracks – one for Verizon and one for the rural LECs.

The PUC established the PaUSF through its *Global Order* in which it stated:

*“The USF is a means to reduce access and toll rates for the ultimate benefit of the end-user and to encourage greater toll competition, while enabling carriers to continue to preserve the affordability of local service rates. Although it is referred to as a fund, it is actually a pass-through mechanism to facilitate the transition from a monopoly environment to a competitive environment--an exchange of revenue between telephone companies which attempts to equalize the revenue deficits occasioned by mandated decreases in their toll and access charges.”<sup>37</sup>*

The establishment of the PaUSF was carried out on a revenue-neutral basis and included the rebalancing of intrastate access charges, toll rates, and local rates by the rural local exchange carriers.

The *Global Order* of September 30, 1999 reduced access charges of all local incumbent exchange carriers operating in Pennsylvania. That order directed a PaUSF be established to enable the rural ILECs and Sprint/United to reduce access charges and intraLATA toll rates while at the same time ensuring that residential basic local service rates did not exceed the designated price cap of \$16.00 per month. The *Global Order* also called for an investigation to be initiated in January 2001 to further refine a solution to the question of how the carrier charge (CC) pool could be reduced and to consider the appropriateness of a toll line charge to recover any resulting revenue reductions.

Access charges provide a significant source of ILEC earnings and contain implicit and explicit subsidies for local rates. This combination of earnings and subsidy was approved pursuant to a public policy of encouraging universally available and relatively affordable telecommunications services while providing earnings sufficient to attract stable investment in a national communications infrastructure. Consequently, public policy over time has resulted in a situation wherein higher cost areas, such as rural areas, with lower density cell rates and longer loop distances, obtain rate support from lower cost areas, such as urban areas with higher density cell rates and shorter loop distances. Access charges provide a source of earnings while keeping basic local service rates lower than might otherwise be the case in high cost areas.

In 2001, the PaPUC took the following action. “[W]e shall initiate an investigation on or about January 2, 2001, to further refine a solution to the question of how the Carrier Charge (CC) pool can be reduced. At its conclusion, but no later than December 31, 2001, the pool will be reduced. In addition, we shall consider the appropriateness of a Toll Line Charge (TLC) [or an intrastate Subscriber Line Charge] to recover any resulting reductions.”

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<sup>37</sup> Pennsylvania Public Utility Commission, “Docket No. P-00991648 and Docket No. P-00991649: Opinion and Order,” August 26, 1999. (“Global Order”), p. 134.

In late 2002 a case was initiated to review Verizon's access rates and litigated throughout 2003. A PUC Order was issued in July 2004 ordering some reductions in Verizon's access rates, and remanding the case back to the ALJ to determine a timetable for further access reductions. The remanded case was litigated throughout 2005 with an ALJ Recommended Decision being issued on December 7, 2005 whereby the ALJ recommended that Verizon's Carrier Charge be eliminated within 6 months and intrastate traffic-sensitive rates be reduced to interstate levels within 1-2 years. In January 2007, the PUC decided to stay a decision in the case for a year to await "imminent" FCC action. The PUC has subsequently stayed the case again.<sup>38</sup>

On July 15, 2003, the Commission entered an order granting a Joint Procedural Stipulation filed on June 5, 2003, by the RTCC, Sprint/United, OTS, OCA, OSBA, AT&T Communications of Pennsylvania, Inc., Verizon and MCI WorldCom Network Services, Inc. The July 15 order further reduced intrastate access charges for the rural telephone companies operating within the Commonwealth and increased the cap on basic residential local service rates from \$16.00 to \$18.00 per month. The size of the PaUSF was not changed. No regulations were promulgated to alter the regulation governing the PaUSF or to terminate the fund.

In December 2004, the PUC initiated a case to review the rural LECs' access rates. In August 2005, prior to any real litigation occurring in the case, the PUC stayed the case for a year as a result of "imminent" FCC action. The PUC issued additional "one year" stays on November 16, 2006 and April 24, 2008 over the objections of AT&T and Verizon. On March 25, 2009, the rural LECs requested that the PUC again stay the access investigation for another year – AT&T, Verizon, Qwest and Sprint opposed the additional one year stay. On March 19, 2009, AT&T filed a Complaint against the rural LECs' intrastate access rates (see more, below). The rural LECs moved to dismiss the Complaint and AT&T filed against that dismissal on May 13, 2009.

On December 20, 2004, the Commission entered an order instituting an investigation into whether there should be further intrastate access charge reductions and intraLATA toll rate reductions in the service territories of rural incumbent local exchange carriers. . . . to address possible modifications to the PaUSF regulations and the simultaneous institution of a proceeding to address all resulting rate issues should disbursements from the PaUSF be reduced in the future. The December 20 Order directed the Office of Administrative Law Judge (OALJ) to conduct the appropriate proceedings including, the following questions:

- a) Whether intrastate access charges and intraLATA toll rates should be further reduced or rate structures modified in the rural ILECs' territories.
- b) What rates are influenced by contributors to and/or disbursements from the PaUSF?
- c) Should disbursements from the PaUSF be reduced and/or eliminated as a matter of policy and/or law?
- d) Assuming the PaUSF expires on or about December 31, 2006, what action should the Commission take to advance the policies of this Commonwealth?
- e) If the PaUSF continues beyond December 31, 2006, should wireless carriers be included in the definition of contributors to the Fund? If included, how will the Commission know which wireless carriers to assess? Will the Commission need to require wireless carriers to register with

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<sup>38</sup> Painter, Michelle, "History of Access in PA," The Painter Law Firm, undated.

the Commission? What would a wireless carrier's contribution be based upon? Do wireless companies split their revenue bases by intrastate, and if not, will this be a problem?

f) What regulatory changes are necessary to 52 Pa. Code §§ 63.161--63.171 given the complex issues involved as well as recent legislative developments?

In summary, there are several laws/policies unique to Pennsylvania that affect access reform and increases in local rates. It is useful to briefly review them. First, in late 2004, a law was passed (Act 183) that requires access reductions to be revenue neutral. Second, there is a PUC-imposed rate cap of \$18. Third, as part of alternative regulation, Act 183 allows ILECs to increase their “protected” rates by the rate of inflation in exchange for accelerating broadband deployment. There are essentially 2 protected rates – local and access. Many RLECs are “banking” their Act 183 rate increases rather than increasing local rates, and if the “banked” increases are not used within 4 years, they will expire and be lost.<sup>39</sup> One RLEC recently tried to raise access rates as part of their Act 183 annual inflation increases. The PUC rejected this attempt as a result of a Verizon complaint. The same RLEC then demanded that it recover its inflation increase from the state USF. That issue is now part of a litigated case where the PUC is looking at whether the rate cap should be raised and whether the USF funding for RLECs should be either increased or decreased, and whether RLECs should be allowed to recover their Act 183 inflation increases from the USF (the PUC prohibited parties from addressing access reductions in this case).<sup>40</sup>

By order entered August 30, 2005, the Commission stayed the investigation for a period not to exceed 12 months unless extended by Commission order, or until the FCC issued its ruling in its *Unified Intercarrier Compensation* proceeding. It further ordered that upon the expiration of the 12-month stay of the investigation or the issuance of a FCC ruling in the *Unified Intercarrier Compensation* proceeding, whichever occurred earlier, the parties to the proceeding should submit status reports to the Commission pertaining to common or related matters in the instant investigation and the FCC's *Unified Intercarrier Compensation* proceeding and the need for any coordination of those matters or any new matters that may arise once the instant investigation is reinstated. It also stated that it would entertain future requests for further stays of this investigation for good cause shown and for the purpose of coordinating this Commission's action with the FCC's ruling in its *Unified Intercarrier Compensation* proceeding.

In July, 2006, the so-called Missoula Plan was submitted to the FCC. Generally, the Missoula Plan sought to unify intercarrier charges for all traffic over a 4-year time period, reduce intercarrier compensation rates, provide an ability to recover those reduced rates through explicit means, move rates for all traffic closer together, and establish uniform default interconnection rules. This FCC proceeding continues to have significant potential to directly impact the issues in the instant proceeding.

By order dated November 15, 2006, the Commission again stayed the investigation pending the outcome of the FCC's *Unified Intercarrier Compensation* proceeding, or until November 15,

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<sup>39</sup> Pilalis, Labros E., “Regulatory Update – Telecommunications”, Pennsylvania Bar Institute, Pennsylvania Public Utility Law Conference, May 7-8, 2009. Accessed at <http://www.pbi.org/resources/extras/puc/Pilalis.pdf>

<sup>40</sup> Painter, Michelle, “History of Access in PA,” The Painter Law Firm, undated.

2007, whichever was earlier. The Commission granted the stay but allowed for a limited investigation into the rate caps on residential and business rates, as well as the PaUSF.

In January 2007, the Commission entered an order staying a pending investigation involving the Verizon companies pending the outcome of the FCC's Intercarrier Compensation proceeding or for a period of one year until January 8, 2008, whichever is less. The Commission granted Verizon a further one-year stay by order entered September 11, 2008.

The FCC has not made a decision to date regarding its intercarrier compensation proceeding. On March 25, 2009, PTA, OCA, and Embarq PA filed a Joint Motion for further stay of the investigation. Verizon, Sprint, Qwest, and AT&T filed opposing Answers to the Motion.

At the PaPUC Public Session of July 23, 2009, the Commission took up the related matters of the “Investigation-Intrastate Access Charges and IntraLATA Toll Rates of Rural Carriers & The PA Universal Svc Fund, 1189996-LAW, I-00040105 and AT&T Communications of PA LLC v. Armstrong Telephone Company, 2098380-OSA, C-2009-2098380, C-2009-2099805, C-2009-2098735. It noted that the FCC is considering a Notice of Proposed Rulemaking and 3 proposals that intrastate and interstate access charges mirror each other at a rate of \$.0007 per minute.

While the FCC’s action may have a large impact on the PaPUC’s investigation, it was decided not to wait any longer to see the results. The Commission consolidated pending issues related to intrastate access charges and the PA universal service fund and related complaints, reopened the Intrastate Access Charge Investigation, and ordered the parties to develop a record before an administrative law judge who shall issue a Recommended Decision within 12 months.

#### 1.4.3 Pending Issues

The question of rural access charges, which is intimately interwoven with questions of competition and universal service, is not just a technical or economic question – it has broad social and political implications. In this regard, the Commonwealth’s Office of the Consumer Advocate has weighed in opposing any action, which might raise rural residential rates, saying:

*“Pennsylvania’s smaller rural telephone companies rely in large part on access charges from other telecommunications companies to support the cost of their networks. From my perspective, all parties who use the public switched telephone network should contribute to the support of that network . . . my primary concern for telecommunications service in Pennsylvania is the assurance of universal service at reasonable and affordable rates for every Pennsylvanian who wishes to have such service. That is not just my goal, however. The first clause of the first sentence of Chapter 30 that was added to the Pennsylvania Public Utility Code in 1993 states that: ‘The General Assembly finds and declares that it is the policy of this Commonwealth to: (1) Maintain universal telecommunications service at affordable rates...’ When Chapter 30 was re-enacted in Act 183 of 2004, this same language appeared in the second Declaration of Policy.”<sup>41</sup>*

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<sup>41</sup> Popowsky, Sonny, “Before the House Consumer Affairs Committee: Testimony Regarding Telecommunications, Cable & Wireless Industry,” PA Office of Consumer Advocate, February 11, 2009, accessed at [http://www.oca.state.pa.us/Testimony/2009/Test\\_2009.htm](http://www.oca.state.pa.us/Testimony/2009/Test_2009.htm)

The state universal service program is intended to provide a reasonable level of access to affordable telecommunications services for all Pennsylvanians, including those who live in our most rural and sparsely populated communities. Universal telephone service is one of the forces that helps bind our Commonwealth together. The PaUSF to established to enable the rural ILECs and Sprint/United to reduce access charges and intraLATA toll rates while, at the same time, ensuring that residential basic local service rates did not exceed the designated price cap of \$16.00 per month.<sup>42</sup>

When our Pennsylvania telecommunications framework was reenacted in 2004, the General Assembly maintained a carefully drawn category of “protected” services, including basic residential service, that continue to be subject to a higher level of Commission scrutiny and regulatory protection. Specifically, in Act 183 of 2004, the General Assembly included protections for residential basic service customers of both rural and non-rural incumbent local exchange companies. With respect to rural local exchange companies, the most important protection was a provision which stated that “rate change limitations set forth in a local exchange telecommunications company’s effective commission approved alternative form of regulation plan or any other commission-approved annual rate change limitation shall remain applicable and shall be deemed just and reasonable.”<sup>43</sup>

One of the rate limitations that was in effect for rural telephone companies at that time was a provision that basic local service bills were capped at \$18 per month, and that any increases above the \$18 level were to be recovered from the state Universal Service Fund, rather than from the customer. While I believe that the level of that rate cap may be subject to change, after notice and hearing by the PUC, I am concerned that the very existence of the cap and the continuation of the Pennsylvania Universal Service Fund are under challenge by some of our largest telecommunications companies such as Verizon and AT&T. Maintaining a cap at a reasonable level and retaining the state Universal Service Fund can help ensure that the basic residential rates of our most rural telephone companies are affordable and that those rates are comparable to the rates charged by Verizon in the remainder of the state.<sup>44</sup>

#### 1.4.4 The AT&T Complaint and the Rural Carriers Response<sup>45</sup>

As noted above, AT&T has filed a separate complaint, raising issues similar to those involved in the “Investigation Regarding Intrastate Access Charges and IntraLATA Toll Rates of Rural Carriers and the Pennsylvania Universal Service Fund.” Essentially, AT&T makes the following arguments.

The rural LEC’s current rates are not “just and reasonable.” The Commission should eliminate the residential rate cap. Even without the \$18 rate cap, the market is sufficiently competitive to

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<sup>42</sup> Ibid.

<sup>43</sup> Ibid.

<sup>44</sup> Ibid.

<sup>45</sup> Adapted from Painter Law Firm, “*Formal Complaint: AT&T Communications of Pennsylvania et al. v. Pennsylvania Rural Incumbent Local Exchange Carriers*”, Pennsylvania Public Utility Commission, March 19, 2009, accessed at [http://www.patel.org/Member\\_Bulletin/2009/09-16-Attachment.pdf](http://www.patel.org/Member_Bulletin/2009/09-16-Attachment.pdf)

ensure that basic rates will remain affordable and just and reasonable. In reality, without the permitted inflation adjustments, the rate cap has actually been declining. Had the rate cap been raised with inflation as permitted it would currently be about \$22.00. The Office of Consumer Affairs says an “affordable” rate would be \$32/month. Retail rates could easily go up without them becoming unaffordable.

Competition from wireless, CLEC’s, cable, VoIP and many new services, as well as the potential for competitive entry, will restrain rates. The small number of customers without any competitive choice can be protected through targeted support mechanisms. The greater portion of rural service is from five big companies, not small, underresourced local entities. Customers of other carriers would be funding the RLECs Chapter 30 rate increases each year. Funds from increasing access rates for “protected services” would be used to subsidize unregulated competitive broadband activities, in violation of state law. This would be highly anticompetitive.

While RLEC’s want to recover their “banked” money and increased expenses, to which they claim to be entitled by law and policy, either from access charges, universal service, or both, such a result would be unlawful and inconsistent with state policy. The USF not intended to shift the cost of broadband networks to customers of other companies. The PaUSF should be converted to an explicit, genuine universal service funding mechanism that actually targets high-cost service areas and low income customers, rather than simply serving as a RLEC revenue guarantee. RLEC’s can increase rates pursuant to the formula to support development of broadband.

The PUC should not use the PaUSF to fund the Chapter 30 retail rate increases, which would be counter to regulations. It would distort competition by having other carriers subsidize RLECs and the USF fund would grow hugely. The PUC should adopt a company-by-company needs based test for USF support, using federal rules based on actual costs.

To which the incumbents generally reply<sup>46</sup>: AT&T has the burden of proof, and it has failed to state any facts and/or produce any evidence to support a cause of action. Simply asserting that rates are not just and reasonable by itself is not sufficient to support a claim when the law expressly presumes that they are. Everything the RLECs have asked for is lawful and consistent with laws or regulations. No statutes, regulations or Orders are being violated. AT&T’s complaint is simply an expression of its preference for a different policy. There is no requirement that intrastate access charges be set at cost, as AT&T requests.

There is already an ongoing Commission investigation of the same topic. This is a ploy to force the Commission to act prematurely, or to end run the current docket by opening another one solely on intrastate access charge levels. AT&T’s case should be consolidated with the ongoing PUC docket (generic investigation). They should proceed, or be stayed, together.

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<sup>46</sup> Adapted from Kennard, Norman, “*DRAFT 1: Answer to Formal Complaint*,” for the Pennsylvania Telephone Association, PA PUC Docket No. C-2009-2098380, April 23, 2009, accessed at [http://www.patel.org/Member\\_Bulletin/2009/09-21-Attachment2.pdf](http://www.patel.org/Member_Bulletin/2009/09-21-Attachment2.pdf) /; Kennard, Norman, “*DRAFT 1: Preliminary Objections and Motion for Stay or Consolidation on Behalf of the Pennsylvania Telephone Association*,” for the Pennsylvania Telephone Association, PA PUC Docket No. C-2009-2098380, April 23, 2009, accessed at [http://www.patel.org/Member\\_Bulletin/2009/09-21-Attachment1.pdf](http://www.patel.org/Member_Bulletin/2009/09-21-Attachment1.pdf)

#### 1.4.5 Treatment of Intrastate Access Charges in Other States

The challenge of intrastate rural access charge reform is inherently structural, and has manifested itself in a wide range of states. This section provides a quick review of some of the approaches used in other state. A common model seems to be the phasing out over a period of time of that amount of access charges that exceeds cost, while providing some transitional compensating model so that the impact on subscribers is not felt all at once. Very often the approach is to order the reduction of intrastate access rates to the same level as interstate access rates, on the assumption that interstate rates are already cost-based, and there is no difference in the facilities and services used to transmit intra- or interstate calls to end users.

Six states have generally ordered (with various conditions) that intrastate access charges be reduced to the level of federal interstate access rates, terms and conditions, and such parity be maintained: Maine, Texas, Oklahoma, Michigan, Indiana and Georgia. Two states – Kansas and Wisconsin -- establish intrastate-interstate switched access parity by statute, but tie the reduction to parity to a participating local exchange carrier's plan for alternative regulation. This approach generally produces at a minimum, a revenue-neutral event. Kansas, over time, in a revenue neutral manner, with rate rebalancing. Wisconsin applies only to companies electing price regulation, or may be otherwise specified under an Alternative Regulation Plan.<sup>47</sup>

Nine states currently require (or have required) interlata-intralata rate matching but generally permit carriers to implement some form of alternative price regulation to ensure revenue neutrality: Alabama (no longer required under Price Flexibility Plan); Ohio; Illinois (CLECs subject to "just and reasonable" standard); Massachusetts (lost access revenues to be made up by retail rate increases); New Mexico; Kentucky (rates capped); Oregon; Tennessee; West Virginia (over a phase-in period). In addition, two states – Mississippi and North Carolina – establish parity by tariff, and Nevada requires such rates be consistent with federal law.<sup>48</sup> There are also approaches which move in the direction of intrastate access rate reduction, without going all the way to parity.

In Virginia, the State Corporation Commission, on May 29, 2009, ordered a significant reduction in the intrastate access rates charged by Embarq, noting that "Embarq's current intrastate switched access rates are more than five times higher than Embarq's comparable interstate switched access rates and are more than three times higher than Verizon's intrastate access rates." It noted that, "Embarq does not contest this finding. Rather, Embarq claims that its intrastate access rates 'act as a subsidy for local exchange telephone service' and that it 'need[s] such subsidies in order to serve its customers.'" The SCC noted that, "The subsidies in intrastate access charges distort the true cost of providing service, the true value of such service, and the development of the market for telephone services." It ordered Embarq to gradually reduce its intrastate access rates by 50% by July 1, 2011. The SCC, based on evidence presented, was not

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<sup>47</sup> Painter Law Firm, "*States with Intrastate/Interstate Access Parity*," undated.

<sup>48</sup> Ibid.

persuaded that this would have a significant impact on the affordability of Embarq’s residential phone services.<sup>49</sup>

In Michigan, a Bill has been proposed which would close the gap between large and small provider intrastate access rates by restructuring the way small companies recover their network costs. This restructuring mechanism — which will act as an independently operated system — will require the participation of all providers but will limit reimbursements to only those providers that have traditionally been responsible for delivering telephone service to customers when no other providers are present. However, even providers eligible for reimbursements will face limitations on how much they can recover based on how their monthly prices compare to a statewide benchmark price. The restructuring mechanism is a coordinated effort by the Michigan Public Service Commission (MPSC), a statutorily created Oversight Committee, and a neutral third party administrator. All telecom providers that connect to the public switched network will continue to pay for that access by participating in the restructuring mechanism.

The MPSC will calculate the total loss of revenues small providers will experience by lowering their intrastate rates to their corresponding interstate levels. The next step is to calculate how much reimbursement eligible providers will forego based on the benchmark price. That amount will be subtracted from the total intrastate access revenue loss to arrive at the total restructuring mechanism amount. Finally, the third party administrator calculates a percentage of retail revenues every provider will be assessed to pay for network access in exchange for lower intrastate access charges.

## 1.5 Competition to Traditional Land-Line Voice Communications

In addressing the issue of access charges of rural telecommunications carriers, it should be noted that it is in a context that requires a long-term solution, as voice communications are migrating away from traditional “wireline” local and long-distance carriers, and to mobile, cable, Voice-over-Internet Protocol (VoIP), “Unified Communications” and many other IP-enabled applications which fall entirely outside of the access regime. The following is a brief discussion of some of the available alternatives which present competition to traditional wireline phone services.

### 1.5.1 Wireline Substitution (Wireless)

In July, 2008, T-Mobile announced a new service which allows home users to abandon their expensive home phone services without losing their phone numbers. The offering gives the customer a wireless router for a onetime charge of \$50 and a monthly fee of just \$10 per month for unlimited nationwide calling over the WiFi internet connection. Customers simply plug their touch tone or wireless home phone into the new router and will then be able to make and receive calls as they once did on their landline (customer needs a broadband connection). This service is also aimed at eliminating the competitive advantage that its big rivals AT&T and Sprint have had

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<sup>49</sup> Virginia, State Corporation Commission, “*SCC Directs Embarq to Reduce Gradually Intrastate Access Charges*,” News Release, May 29, 2009, accessed at [http://www.scc.virginia.gov/newsrel/c\\_emb\\_09.aspx](http://www.scc.virginia.gov/newsrel/c_emb_09.aspx)

in the wired services. To the consumer the service is essentially the same as what they had before, only much less expensive.<sup>50</sup>

According to a September, 2008 study by Nielsen<sup>51</sup>, “Wireless Substitution in the United States,” 17.1 percent of Americans (about 20 million) have dropped their landline for wireless phone service only, a number that is rising at about three to four percent per year. The majority of users who've severed their landline are in lower income brackets (under \$50k), tend to be younger (18-34), and have a smaller household size (1-2 people).<sup>52</sup>

According to another survey reported in November 2009, if survey respondents act the way they say they might, we could see an acceleration of wireline voice substitution during the current recession. Sprint sponsored a survey that found 32 percent of respondents are likely to eliminate their landline service and rely solely on a mobile phone in order to save money. About 18 percent of respondents already do not have landline phone service at their home.<sup>53</sup>

Things have gotten so bad, Saul Hansell, writing in the New York Times, asks, “*Will the Phone Industry Need a Bailout Too?*” Every quarter, he says, the phone companies report they serve ever fewer landlines. They are mainly losing customers to cable companies, which offer competing broadband and voice services that make copper phone lines unnecessary. More people are also deciding to abandon landlines for cellphones. AT&T lost 12 percent of its landlines over the last year. Verizon, which is converting some customers to fiber, lost 10 percent. The story is similar at smaller phone companies like Qwest, Embarq, Fairpoint and Frontier, but these companies, he notes, don't have the wireless business to help bail them out.<sup>54</sup>

His concern is whether the pricing structure of the voice business can hold up. Voice traffic is such a tiny piece of the overall data moved over the Internet that the cost is insignificant. The largest part of the cost of alternative carriers is not the service itself, but subsidies to rural phone carriers by way of what he describes as “an inscrutably complex system” that governs how companies pay each other when connecting long-distance calls (referring the reader to his previous article, “The Very Expensive Myth of Long Distance.” But if competition ever creates a significant shift to Internet-based phone service, he notes, it could quickly decimate the already precarious economics of the local phone business.

Results from the July-December 2009 National Health Interview Survey (NHIS), released in May 2010, indicate that the number of American homes with only wireless telephones continues to grow. Almost one of every four American homes (24.5%) had only wireless telephones (also

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<sup>50</sup> Telecom Monthly, “*The Beginning of the End for Landline Phone Service?*” June 25, 2008. Accessed at <http://telecommonthly.com/2008/06/the-beginning-of-the-end-for-landline-phone-service/>

<sup>51</sup> Nielsen Company, “*Call My Cell: Wireless Substitution in the United States*”, September 2008 at <http://www.nielsenmobile.com/documents/WirelessSubstitution.pdf>

<sup>52</sup> BroadbandDSLReport, “*Landline Use Continues Slow Death*,” Sept. 17, 2008, at <http://www.dslreports.com/shownews/Landline-Use-Continues-Slow-Death-97799>

<sup>53</sup> Titsch, Bob, “*Possible Increase in Wireless Substitution on the Way*,” IPBusiness, Nov. 7, 2009 at <http://www.ipbusinessmag.com/departments/article/id/492/possible-increase-in-wireless-substitution-on-the-way>

<sup>54</sup> Hansell, Saul, “*Will the Phone Industry Need a Bailout, Too?*” The New York Times “Bits”, May 8, 2009 at <http://bits.blogs.nytimes.com/2009/05/08/will-the-phone-industry-need-a-bailout-too/>

known as cellular telephones, cell phones, or mobile phones) during the second half of 2009, an increase of 4.3 percentage points since the second half of 2008. This is the largest 6-month increase observed since NHIS began collecting data on wireless-only households in 2003. Approximately 22.9% of all adults and 25.9% of all children now live in households with only wireless telephones.<sup>55</sup> In the second half of 2008, the numbers of wireless only households exceeded those households that are landline only for the very first time.<sup>56</sup>

According to an article in *The Economist* in August, 2009, despite some of the flakiest mobile-network coverage in the developed world, one in four households in the U.S. has now gone mobile-only. At current rates, it notes, the last landline in America will be disconnected sometime in 2025.<sup>57</sup>

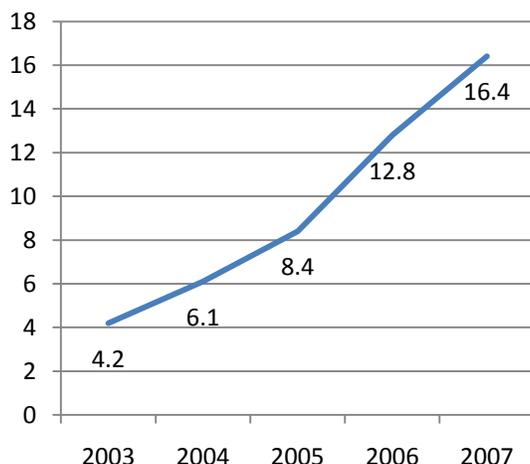


Figure 1.1 Percentage of Wireless-only Households, U.S.  
Source: BroadbandDSL Report.com, Sept. 17, 2008

The more Americans abandon it to go mobile-only or make phone calls over the internet, the more fragile it becomes: its high fixed costs have to be spread over ever fewer subscribers. If the telephone network in New York State were a stand-alone business, it would already be in bankruptcy. In recent years it has lost 40% of its landlines and revenues have dropped by more than 30%.

In September, 2009, it was reported that Ivan Seidenberg, chief executive of Verizon Communications, speaking to a Goldman Sachs investor conference, said Verizon was simply no longer concerned with telephones that are connected with wires. All traditional phone companies, he noted, are suffering because many customers are canceling their landlines in order to use phone service from their cable companies or simply to rely on their cellphones. “Video is

<sup>55</sup> “Wireless only households in the USA rising,” *Cellular News*, May 12, 2010, at <http://www.cellular-news.com/story/43293.php>

<sup>56</sup> Abram, Stephen, “*Wireless Substitution*,” Stephen’s Lighthouse, May 13, 2009 at [http://stephenslighthouse.sirsidynix.com/archives/2009/05/wireless\\_substi.html](http://stephenslighthouse.sirsidynix.com/archives/2009/05/wireless_substi.html)

<sup>57</sup> *Economist.com*, “*Unwired: As More People Ditch Landline Phones for Mobiles, America’s Regulators Need to Respond*,” August 13, 2009 at [http://www.economist.com/opinion/displaystory.cfm?story\\_id=14213965](http://www.economist.com/opinion/displaystory.cfm?story_id=14213965)

going to be the core product in the fixed-line business,” Mr. Seidenberg declared. And the focus will move from selling bundles of video and landline to video and cellphones, he added. “Once I shed myself of the burden of chasing the inflection point in access lines and say ‘I don’t care about that anymore,’ I am actually liberated,” he said.<sup>58</sup>

On October 22, 2009, it was reported that AT&T Mobility set the bar high for third quarter results posting just over 2 million net customer additions for the quarter, which was a record for the carrier and a 2.5% increase over the third quarter of 2008. AT&T Mobility attributed the strong growth to sales of smartphones and other integrated devices as well as the launch of Apple Inc.’s newest iPhone 3GS during the quarter.<sup>59</sup> Analysts pointed out that the company’s older wireline units have become increasingly less important to AT&T’s future growth.<sup>60</sup>

Likewise, the Denver telecommunications company Qwest, like its larger peers Verizon Communications Inc. (VZ) and AT&T Inc. (T), has been hit by the downturn in consumer spending, which has accelerated the willingness to drop traditional phone lines. The company ended the quarter with 10.6 million access lines, down 11% from a year earlier.<sup>61</sup>

Some of the concern about the possible acceleration of customer migration away from landlines is due in the short term to the current (2009) economic situation, but in the long term to the fact that the switch appears to be generational, with younger people more likely to be more comfortable using mobile phones and the Internet, with no traditional landline.

### 1.5.2 Cable Telephony

Most cable companies have launched Voice over Internet Protocol (VoIP) phone service, or digital phone service, providing consumers an alternative to standard telephone service. More than 21.2 million homes are now subscribing to cable’s digital phone service – a number that continues to grow.

Most cable companies have launched Voice over Internet Protocol (VoIP) phone service, or digital phone service, providing consumers an alternative to standard telephone service. Cable’s digital phone service is now available to well over 100 million U.S. homes and more than 21.2 million households currently subscribe.

While some cable operators have offered traditional circuit-switched telephone service for years, most are now offering digital phone service. This service often comes as part of a “bundle”

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<sup>58</sup> Hansell, Saul, “Verizon Boss Hangs Up on Landline Phone Business,” New York Times “Bits”, Sept. 17, 2009 at <http://bits.blogs.nytimes.com/2009/09/17/verizon-boss-hangs-up-on-landline-phone-business/>

<sup>59</sup> Meyer, Dan, “AT&T Mobility Posts Company Record 2M Net Adds,” RCRWireless.com, October 22, 2009 at [http://www.rcrwireless.com/apps/pbcs.dll/article?AID=/20091022/QUARTERLY\\_EARNINGS/910229996/AT&T-Mobility-posts-company-record-2M-net-adds](http://www.rcrwireless.com/apps/pbcs.dll/article?AID=/20091022/QUARTERLY_EARNINGS/910229996/AT&T-Mobility-posts-company-record-2M-net-adds)

<sup>60</sup> Bartash, Jeffry, “AT&T 3Q Seen Stable on Assist from iPhone,” WSJ.com, October 16, 2009 at <http://online.wsj.com/article/BT-CO-20091016-705558.html>

<sup>61</sup> Cheng, Roger, “2<sup>nd</sup> UPDATE: Qwest 3Q Net Down; Provides More Upbeat ’09 View,” WSJ.com, October 28, 2009 at <http://online.wsj.com/article/BT-CO-20091028-712070.html>

where multichannel video, high-speed Internet and voice services are offered as a package and billed in a single invoice, providing a better value and more simplicity for customers.

Calls are placed over an IP-based data network and voice is transmitted with data "packets," which are bundles of digital data that can be reassembled at their destination. For example, the IP data packets used by services from some of the Internet telephone providers (e.g., Skype, Vonage) travel over the "public Internet", facilities-based cable offerings transport IP data packets over their private managed IP networks with end-to-end managed quality of service (interconnecting with the PSTN as necessary).

### 1.5.3 IP-Enabled Services

The landscape of voice communications was significantly altered by the advent of voice services over the Internet, commonly referred to as Voice over Internet Protocol (VoIP). The traditional concept of "telephone service" is being replaced by a multiplicity of voice-enabled IP applications. Personal communications are moving from voice-only to multiple integrated services, and from geographic to non-geographic connections. The emerging IP-based model is user-centric, not network centric, and is driven primarily by software, not hardware.

The implementation of "voice" on the Internet appears to be a process in four stages. The first stage was the introduction of point-to-point voice call technologies and the emergence of businesses holding themselves out to the public as providing services similar/equivalent to those of telephone companies.

This was followed by the emergence of VoIP services companies such as Vonage (founded in 2001), Skype (2003) and many more, offering a range of services primarily focused around voice, and raising the question of their relationship to traditional telephone service (a substitute? a complement?).

The second wave of voice enabled services involved the entrance of new, large players who were interested in having voice functionality, but not necessarily to offer "voice" as a separate service, but to combine it with other capabilities as part of a more integrated offering. For example:

- e-Bay purchased Skype
- AOL (VoIP and Messaging) (AIM Call Out)
- MSF/Yahoo (pending) (Yahoo Messenger Voice)
- Google (Google Talk)

The third wave is the emergence from major companies of services, initially directed to the enterprise market, that combine multiple communications services seamlessly from the desktop or an IP enabled headset or handset. These are generally described as "unified communications" or "integrated communications." Given the number of people who either primarily or partly work at home, these can be expected to affect the residential market as well.

The fourth wave is the emergence of voice as an embedded application in practically every Internet application in which humans contact each other, as well as in human to device

applications. This includes e-commerce, games, Web 2.0 social networking sites, personal web pages, etc.

### 1.5.3.1 Google Voice: Application as Carrier?

Federal Communications Commission Chairman Julius Genachowski has pledged to open an inquiry into the prices telecom firms charge others for the network capacity needed to transfer phone calls and Internet exchanges, signaling that further regulation of that market may be on the horizon. In a letter sent to Sen. Daniel Inouye, D-Hawaii, Genachowski said the FCC will issue a public notice within the next 30 days (starting Oct. 8, 2009) seeking comment on the "appropriate analytical framework" for examining the network pricing structure.<sup>62</sup>

Google Voice has narrowed its blocking of outbound calls to fewer than 100 U.S. telephone numbers<sup>63</sup> that have high termination access fees and are used by free conferencing and adult chat-line providers, Google said late Wednesday in a letter to the FCC. Google said the blocking is permissible because the company provides an information service.<sup>64</sup>

Google had been noncommittal on the proper classification of its VoIP service. FCC rules ban telecom service providers from blocking expensive phone calls as "self-help." AT&T complained to the commission that Google Voice competes with conventional phone service and should come under the same rules. The carrier said differing treatment of Google and AT&T was inconsistent with the fourth principle of the FCC's Internet policy statement, requiring fair competition among application providers.

"Whether Google decides to use a broadsword or a rapier to engage in call blocking is beside the point," said Ross Buntrock, an Arent Fox attorney who represents FreeConferenceCall.com and several rural local exchange carriers whose calls are being blocked. Google Voice and services like it "take advantage of the nation's ubiquitous" public switched telephone network "and numbering resources (through their CLEC vendors) to provide their 'free' services," he said. But use of the network isn't free, Buntrock said. "Google Voice employs the public switched telephone network to provide its service and thus should pay the same access charges that any long-distance provider must pay."<sup>65</sup>

On October 14, 2009, the US House of Representatives Committee on Energy and Commerce sent a request for information to long-distance carriers AT&T, Sprint, Verizon and Qwest in light

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<sup>62</sup> Johnson, Fawn, "FCC to Examine Network Connection Prices," Smartmoney.com, October 8, 2009 at <http://74.125.95.132/search?q=cache:4FBfXcY0BMUJ:www.smartmoney.com/breaking-news/on/%3Fstory%3DON-20091008-000640-1757+FCC+to+Examine+Network+Connection+Prices,+Smartmoney&cd=1&hl=en&ct=clnk&gl=us&client=firefox-a>

<sup>63</sup> Arent Fox, "Developments in Intercarrier Compensation," This Week in Telecom, November 2, 2009 at [http://www.arentfox.com/publications/index.cfm?fa=legalUpdateDisp&content\\_id=2184](http://www.arentfox.com/publications/index.cfm?fa=legalUpdateDisp&content_id=2184)

<sup>64</sup> Johnson, Fawn, "Google Phone Service Poses Questions for Regulators," Total Telecom, Sept. 18, 2009 at <http://www.totaltele.com/view.aspx?ID=449082>

<sup>65</sup> Arent Fox, "Developments in Intercarrier Compensation," This Week in Telecom, November 2, 2009 at [http://www.arentfox.com/publications/index.cfm?fa=legalUpdateDisp&content\\_id=2184](http://www.arentfox.com/publications/index.cfm?fa=legalUpdateDisp&content_id=2184)

of recent news reports that VoIP-based calling service providers are blocking calls to rural areas “due to the allegedly excessive terminating access charge rates required by some rural incumbent local exchange providers.” The Committee requested information on whether the IXCs are currently engaged in any terminating access charge disputes, which particular carrier the dispute is with, and the total dollar amount of access charges the IXCs are withholding. The IXCs' written responses were to be submitted to the Committee by October 27, 2009.<sup>66</sup>

On September 8, 2009, Verizon filed an ex parte letter with the FCC to urge the Commission to include the ongoing intercarrier compensation reform proceedings (CC Docket 01-92) with the Commission's *National Broadband Plan for Our Future* docket (GN Docket 09-51). Verizon stated that the existing regime of intercarrier compensation generates inefficient arbitrage opportunities and is in need of fundamental reform. Verizon also urged the commission to reform the universal service system, arguing that the current revenue-based system was rooted in a wireline world that is no longer a reality.<sup>67</sup>

### 1.5.3.2 Unified Communications<sup>68</sup>

Unified Communications and Collaboration (UCC) is the convergence of collaboration software such as e-mail and IM (instant messaging) with communications products such as VOIP (voice over IP). The global market for UCC-type products, which blend all forms of real-time communications, is estimated to be US\$17 billion by 2011. These products are directed initially at the enterprise market, but given the number of people who work completely or partially at home, it is reasonable to expect they will impact residential use as well.

Microsoft has for some time offered a voice-enable application called “Net Meeting.” UCC builds on and expands that base. According to Bill Gates, “A fundamental reason that communicating is still so complex is the fact that the way we communicate is still bound by devices. In the office, we use a work phone with one number. Then we ask people to call us back on a mobile device using another number when we are on the go, or reach us on our home phone with yet another number.”

“A new wave of software-driven innovations will eliminate the boundaries between the various modes of communications we use throughout the day. Soon, you’ll have a single identity that spans all of the ways people can reach you, and you’ll be able to move a conversation seamlessly between voice, text and video and from one device to another as your location and information-sharing needs change,” he said. “In 10 years from now when you see a desktop phone in a

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<sup>66</sup> Johnson, Fawn, “CORRECT (10/14): Lawmakers Query Big Phone Cos on Rural Connection Rates,” WSJ Online, October 215, 2009 at <http://online.wsj.com/article/BT-CO-20091015-709130.html>

<sup>67</sup> Lasar, Matthew, “Is AT&T Targeting Google Voice to stop ‘Traffic Pumping’?” Ars Technica, October 12, 2009, at <http://arstechnica.com/tech-policy/news/2009/10/att-accused-of-regulatory-capitalism-as-fcc-probes-google-voice.ars>

<sup>68</sup> Section adapted from Taylor, Richard, “Regulatory Implications of ‘Unified Communications’: Will Microsoft be the World’s Biggest Phone Company?”, 17<sup>th</sup> Biennial Conference, International Telecommunications Society, Montreal, 2008.

movie, you will remember the days when you had one of those on your desk,” Gates said. According to Jeff Raikes, President of Microsoft’s Business Division, over the next three years “more than 100 million people will be able to click-to-communicate”.

IBM officials said the company is going full bore into UCC in 2008, recognizing estimates from IDC that project the market will top \$17 billion by 2011. IBM is ramping up its growth in UCC to meet challengers such as Microsoft. In April 2008, IBM unveiled its new Lotus Sametime Advanced software and pledged to invest \$1 billion to fortify its unified communications and collaboration strategy in the next three years through acquisitions, internal development and new services.

Lotus Sametime Advanced integrates social networking profiles from IBM's Lotus Connections suite to help corporate workers more quickly reach out to colleagues or experts to answer their questions. The software also includes features persistent group chat and instant screen-sharing capabilities to facilitate continuous, threaded conversations. IBM's UCC strategy comes with a nod toward the future. Company officials predicted that in five years UCC will play a major role as corporate employees continue to work out of their home offices, where click-to-call and other tools to enable business processes will be employed. Moreover, IBM expects open interoperability across business and public domains, with industry standards coalescing around UCC.

#### 1.6 Traffic pumping/access charge stimulation

One of the consequences of the current access charge regime is the practice referred to as “traffic pumping” by its opponents and “access charge stimulation” by its supporters. Utilizing imbalances in the rural intercarrier compensation (“ICC”) system, local carriers partner with private companies generating high, one-way (inbound) traffic to increase access charge payments, that are then shared with the companies generating the traffic. For purposes of convenience, it will be abbreviated herein as TP/AS.

Relay service providers such as free conference calling services and “chat” services locate “relay” equipment in high access termination areas in exchange for a portion of the “stimulated” access caused by the “free” conference (or other) calls. This builds a high volume of inward bound traffic (to the rural carrier) with little or no offsetting outbound traffic. The carrier then shares the revenues from these charges with the companies. Some rural phone companies appear to have specifically raised their rates to take advantage of this opportunity. Rural carriers say this helps them offset declining revenues without calling on state or federal universal service funds.<sup>69</sup>

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<sup>69</sup> Canis, J. (2009). Transmittal of “*Open Letter of 20 Telecom CEO’s: Submitted in WC Docket No. 09-152 Re: The Commission Must Put a Stop to IXC Theft of Service and Self-Help Refusals to Pay Access Charges*”. September 21, 2009. Accessed June 10, 2010 at <https://prodnet.www.neca.org/wawatch/wwpdf/921ceos.pdf>; Canis, J. (2007). “*Re: Response to AT&T Ex Parte Filing in WC Docket No. 07-135: Establishing Just and Reasonable Rates for Local Exchange Carriers, and Request for Declaratory Ruling*”. Ex Parte Filing WC Docket No. 07-135, August 15, 2007. Accessed June 30, 2010 at <http://puc.sd.gov/commission/dockets/telecom/2008/tc08-065/exhibit7.pdf>

Notably, these relay service providers do not need to establish a physical, local presence in order to route their calls in this way. Many of these companies are located in Los Angeles, California.<sup>70</sup> Major long distance carriers have referred to these arrangements as “shams” and “kickbacks”.

Big carriers say these “scams” threaten the stability of “all-you-can eat” calling plans.<sup>71</sup> Rural carriers say the big carriers are just objecting to rates they don’t like and to competition to their own call conferencing services. The legality of this kind of ICC arbitrage is being contested before state regulators, in the courts, at the FCC, and now before Congress. In response to these practices, carriers have sometimes resorted to “self-help” by blocking calls or withholding allegedly due payments, both practices disfavored by the FCC.<sup>72</sup>

### 1.6.1 History

In 1996, AT&T filed a complaint with the FCC against Jefferson Telephone Company, a rural incumbent local exchange carrier (ILEC) based in Iowa, which entered into a commercial agreement with a chat-line provider. AT&T’s complaint alleged that Jefferson violated Section 201(b) of the Communications Act of 1934 because it “acquired a direct interest in promoting the delivery of calls to specific telephone numbers.” AT&T also argued that the access revenue-sharing arrangement with the chat-line provider was unreasonably discriminatory in violation of Section 202(a) of the Act, because Jefferson did not share revenues with all its customers. The FCC rejected both these arguments and denied AT&T’s complaint.

In 2002, the FCC issued two more orders, denying similar complaints by AT&T directed at LECs that shared access revenues with chat-line providers. In *AT&T v. Frontier Communications*, the Commission rejected AT&T’s allegations that “revenue-sharing arrangements” constituted unreasonable discrimination in violation of Section 202(a) or violations of the ILECs’ common carrier duties under Section 201(b). In *AT&T v. Beehive Telephone*, the FCC again denied AT&T’s complaint against a LEC that engaged in a commercial relationship with a chat-line provider for the same reasons.

In June, 2007, the FCC adopted a “Declaratory Ruling and Order” regarding “Establishing Just and Reasonable Rates for Local Exchange Carriers,” in which it took up the question of whether call blocking by interexchange carriers (IXCs) was an appropriate response to access stimulation by rural carriers (LECs and CLECs). The IXCs had complained that the result of increased terminating intrastate traffic for LECs due to access stimulation resulted in significant, unpermitted overearnings that were not the mandatory “just and reasonable” rates. The FCC

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<sup>70</sup> Bruce Meyerson (May 7, 2007). Rural companies, AT&T tussle over phone rates. *Seattle Times*, Accessed July 27, 2010, at [http://seattletimes.nwsourc.com/html/business/technology/2003696332\\_btphoneblocking07.html](http://seattletimes.nwsourc.com/html/business/technology/2003696332_btphoneblocking07.html).

<sup>71</sup> Davidson, P. (2008). “*Big Telecoms Decry High Costs of ‘Traffic Pumping’*”. *USA Today*, June 6, 2008. Accessed July 13, 2010 at [http://www.usatoday.com/money/industries/telecom/2008-06-05-traffic-pumping-phone-carriers\\_N.htm](http://www.usatoday.com/money/industries/telecom/2008-06-05-traffic-pumping-phone-carriers_N.htm)

<sup>72</sup> Federal Communications Commission (2007). “*In the Matter of Establishing Just and Reasonable Rates for Local Exchange Carriers: Order*”. WC Docket No. 07-135, DA 07-5082, Adopted December 20, 2007. Accessed July 12, 2010 at [http://fjallfoss.fcc.gov/edocs\\_public/attachmatch/DA-07-5082A1.txt](http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-07-5082A1.txt)

found that the claims of the IXCs about unreasonable access charges were not sufficient to support call blocking and reaffirmed its prior decisions that no carriers may block, choke, reduce or restrict traffic in any way.

In October, 2007, the FCC initiated a proceeding to address the issue further by issuing a Notice of Proposed Rulemaking on “Establishing Just and Reasonable Rates for Local Exchange Carriers,” which invited comments on all aspects of traffic stimulation and asking, “whether our existing rules governing the setting of tariffed rates by LECs provide incentives and opportunities for carriers to increase access demand endogenously with the result that the tariff rates are not longer just and reasonable”. It also invited the suggestion of “remedies” should such be the case. The proceeding is still open.

In August, 2009, the Iowa Utilities Board (IUB) held strongly against some local companies:

*“In this order, the Board finds that the Respondents failed to comply with the terms and conditions of their own intrastate access tariffs, so the calls in question were not subject to access charges and refunds and credits are required. The conference calling companies were not “end users” as defined in the access tariffs because they did not order, purchase, get billed for, or pay for local exchange service. Calls to the conference bridges were not terminated at the end user’s premises, as required by the tariff. Many of the calls were laundered in an attempt to make it appear they were terminated in one Respondent’s exchange, when in fact they were terminated in another exchange where the Respondent was not authorized to provide service.” (Iowa Utilities Board).<sup>73</sup>*

Except for one call blocking finding against Sprint, the decision was unfavorable for the rural carriers, which may have to return the fees they received for calls directed to traffic-pumped services by Iowa residents. However, damages have not yet been assessed and the Iowa Utilities Board does not have jurisdiction over the vast majority of disputed calls—those that were directed to Iowa from callers in other states—so the reach of its decision is limited. Moreover, the Board has indicated that it is reconsidering its decision and several appeals have been filed challenging the lawfulness of the Board’s order, thus it is not yet a final decision.

The FCC has more recently issued an order in a case involving an Iowa carrier relating to interstate calls (calls made from any state other than Iowa to an Iowa telephone number). In that order, the FCC determined that the Iowa carrier was not entitled to collect the entire amounts it billed to a long distance carrier, but that it was nevertheless entitled to some compensation. The exact amount of payment has not yet been fixed by the FCC. According to the FCC, “The tariffed rates are deemed lawful only to the extent that the tariff actually applies, and we have now determined that the tariff does not apply to the services that Farmers provided to Qwest with respect to traffic destined for the conference calling providers.” (FCC Qwest v. Farmers 2009).

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<sup>73</sup> Iowa, State of, Department of Commerce, Utilities Board (2009). “*In Re: Qwest Communications Corporation v. Superior Telephone Cooperative, et al. Final Order*” Docket No. FCU-07-2. Issued September 21, 2009. Accessed July 15, 2010 at <https://efs.iowa.gov/efiling/groups/external/documents/docket/023026.pdf/>

## 1.6.2 Arguments for TP/AS

A spirited defense of “access stimulation”, specifically with regard to the provision of free conference calling, has been made in a report entitled the “FACT Report” by Pearce and Barrett of Information Age Economics.<sup>74</sup> The Report concludes that, despite claims to the contrary, long distance carriers are generating profits from calls delivered to free conference calling services. The report further concludes that free calling services create positive benefits for IXC’s as the existence of free conferencing services encourages more consumers to procure unlimited long-distance plans, which, on average, are profitable for the IXC’s. The Report further concludes that rather than having a legitimate basis for concerns about access costs associated with free calling services, IXC’s are, in fact, seeking to eliminate competition for their own conference calling services.

In fact, as large Incumbent Local Exchange Carriers (ILECs) (the largest of which are also the largest IXC’s) are abandoning and selling off their rural service areas, rural CLECs, they say, must have other profit centers in order to be able to provide more technologically-advanced services to their traditional customers, and to be able to create and maintain economic and employment opportunities in these underserved areas. Free conference services offer the rural CLECs this important diversification opportunity. And, they note, perhaps the least served communities in the nation are those on American Indian Reservations, where many have formed CLECs to offer modern telecommunications services to their residents, thus acquiring socioeconomic benefits including improvements in employment, education, medical and public safety.<sup>75</sup> For a somewhat different view, albeit with respect to mobile, not terrestrial, termination rates, see Silvestri, Altinsoy, King and Sequeira for Connectiv Solutions, “*The Impact of Traffic Pumping: Industry Study*”).<sup>76</sup>

## 1.6.3 Google Voice and TP/AS

The role of TP/AS was highlighted in a recent dispute centered on Google’s new service, “Google Voice”. It is not necessary to go into this situation in depth here, as it raises other (but also very significant) issues regarding the nature and classification of Google Voice (and similar) services. Broadly described, AT&T noted and objected to the practice of Google Voice declining to connect calls to some numbers which it believed had unreasonably high access rates due to traffic pumping. AT&T was understandably frustrated by this, as it is required to connect to those numbers and pay the high access tariffs. In September, 2009, AT&T sent a letter to the

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<sup>74</sup> Pearce, A., Garrett, W.B. (2010). “*Fact Report: The Economic Impact of Free Conference Calling Services*”. Information Age Economics, March 2010, accessed July 14, 2010 at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020393216>

<sup>75</sup> *Id.*, Pearce and Garrett; see also Lasar, M. (2010). “*Traffic Pumping: threat to everyone? (or just AT&T)*”. Arstechnica, March, 2010. Accessed June 4, 2010 at <http://arstechnica.com/telecom/news/2010/03/traffic-pumping-threat-to-everyone-or-just-att.ars>

<sup>76</sup> Silvestri, B., Altinsoy, H., King, C., and Sequeira, J. (2010). “*The Impact of Traffic Pumping: Industry Study*”, Connectiv Solutions, July, 2010. Accessed July 14, 2010 at <http://www.connectiv-solutions.com/downloads/download.php?Traffic-Pumping-Study.pdf>

FCC requesting Google adhere to the same rules as regulated telecom providers with respect to call blocking.

Google responded to AT&T's letter, stating that Google Voice is not subject to common carrier laws like AT&T or traditional carriers. Therefore, it can block specific phone numbers. In October, the FCC sent a letter to Google asking how it determined which phone numbers to block. Google responded to the FCC's letter stating Google Voice has the ability to restrict calls to high-cost destinations. However, it claims that currently, fewer than 100 US phone numbers are restricted.

#### 1.6.4 Congressional Interest

The debate around the issue of TP/AS has also caught the attention of some in Congress. On February 16, 2010, Commerce Committee Chairman Henry Waxman (D-Calif.) and other key House lawmakers sent letters to the CEOs of top telecom firms, launching a review into "traffic pumping" phone practices. Waxman; Rep. Rick Boucher (D-Va.), chairman of the Communications, Technology and Internet Subcommittee; and Bart Stupak, chairman of the Oversight and Investigations Subcommittee, said the review was prompted by an inquiry by the FCC into Google's practice of blocking such calls to rural areas.<sup>77</sup>

On March 23, 2010, during a telecom forum sponsored by *National Journal*, House Energy and Commerce senior member Rick Boucher, D-Va., said his draft measure on Universal Service Reform would go further than the FCC's current plan. In particular, he pointed to the bill's effort to prevent "traffic pumping schemes," a practice in which phone companies inflate their call volume to boost the inter-carrier compensation fees they collect. "I don't think the commission under its current authorities could do [all that the legislation] could do today," said Boucher, chairman of the Communications, Technology and the Internet Subcommittee. According to a report, the same topic provided a light moment from Boucher, who noted that free calls to pornographic services are possibly being used to boost access charge revenue. "I've never visited them," he noted.<sup>78</sup>

On July 22, 2010, Boucher and Lee Terry, R-Neb. Introduced the Universal Service Reform Act, which would do a number of things to clarify and extend the rules and policies of universal service to broadband, and, among them, IT would prohibit "traffic pumping".

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<sup>77</sup> Kang, Cecilia (2009). "Waxman Scrutinizes Traffic Pumping After Google Voice Inquiry". The Washington Post Online, October 14, 2009. Accessed July 21, 2010 at [http://voices.washingtonpost.com/posttech/2009/10/rep\\_waxman\\_scrutinizes\\_traffic.html](http://voices.washingtonpost.com/posttech/2009/10/rep_waxman_scrutinizes_traffic.html)

<sup>78</sup> Jerome, S (2010). "Boucher Touts His Universal Service Reform Plan". Tech Daily Dose, March 23, 2010. Accessed March 31, 2010 at <http://techdailydose.nationaljournal.com/2010/03/boucher-touts-his-universal-se.php>

### 1.6.5 The National Broadband Plan and TP/AS

The FCC's National Broadband Plan, released in March 2010, recommends that interim solutions to arbitrage problems like traffic pumping be adopted in the relatively near term. It has a more expansive view of the long term solution.

Much of the discussion of "traffic pumping" may be rendered moot if the vision of the future of the U.S. telecommunications system adopted in the FCC's National Broadband Plan ("NBP") is adopted and implemented. The plan envisions the ultimate elimination of access charges based on minutes of use, and migration to an Internet-like IP-based system. In this regard, it appears to be proposing to pre-empt state regulation of access charges.

According to the FCC's NBP, "Most ICC (Intercarrier Compensation) rates are above incremental cost, which creates opportunities for access stimulation, in which carriers artificially inflate the amount of minutes subject to ICC payments. For example, companies have established a "free" conference call service, which provides free services to consumers while the carrier and conference call company share the ICC revenues paid by interexchange carriers. Because the arbitrage opportunity exists, investment is directed to free conference calling and similar schemes for adult entertainment that ultimately cost consumers money, rather than to other, more productive endeavors." (FCC NBP)

### 1.6.6 Status

While in the long run, the "TP/AS" issue may gradually be reduced and eliminated as the basis of transmission on broadband networks evolves away from "minutes of use," it is still very much a troubled issue in the short run. It is clearly a practice inconsistent with the move to reduced and equal access charges, and is an artificial and arguably impermissible practice under federal and state regulations. Notwithstanding the arguments of its proponents, it is a flawed way to try to solve the underlying problem of the economics of rural, high-cost carriers. However, to simply prohibit it, which makes logical sense, will simply relocate the problem to the universal service fund and/or higher end-user/customer rates. The general argument of this paper is that the latter is preferable, if implemented over time, in stages, and that it can be done in a manner that does not induce "rate shock" on rural consumers, while rationalizing the economics of the service and reducing opportunities for arbitrage. In the short run, the FCC has several open proceedings which it could, and should, use to address this matter to provide clarity, stability and predictability for all of the stakeholders.

## 1.7 From Background to Economics

This Section has provided an overview of the history and context of the “Rural Paradox.” It has reviewed events both at the federal and state level, laying out the story of how the policies, regulations, technologies and businesses have co-evolved over an extended period of time. It has also presented some of the reasons the authors think that the need to adapt to these changes is likely to continue for some time into the future, to reflect continuing developments. The goals of public policy do not change, but their implementations clearly need to do so in the face of changing technical and economic realities.

We now turn to a consideration of the economic impacts of a policy to make intrastate access charges close to, or equal to, the charges set by the FCC for intrastate access

## 2. ACCESS CHARGES: ECONOMIC THEORY AND CONSUMER IMPACT

### 2.1 Defining access

Telecommunications access refers to the practice of establishing physical connectivity between networks in order to enable the transmission of some form of data exchange or interoperability between them. Based on the nature of the entity to which access is provided and the type of functionality established by it, Spulber and Yoo have proposed a five-fold typology of access<sup>79</sup>: Retail access enables end-users to avail of the services provided by a network. Whole-sale access refers to the ability of competitors to buy bundles of a network’s service elements, using which specific services can be provided, and then resell these services to customers. Interconnection access requires different networks to connect their networks to each others’ on a reciprocal basis. Finally unbundled access allows competitors to purchase selected unbundled network elements from the incumbent, to be combined with any elements that it owns directly, in order to provide services to end-users.

Armstrong extends this typology by further dividing interconnection access, differentiating between one-way and two-way interconnection.<sup>80</sup> One-way interconnection refers to the situation where a competitor (new entrant or up- or down-stream provider) is required to buy a vital input from an incumbent in order to provide a service to its own customers. One-way interconnection creates the problem of foreclosure, where the incumbent could force the competitor out of the market by either refusing to interconnect or by raising prices to prohibitive levels.<sup>81</sup> Two-way interconnection implies the establishment of access between similarly placed networks who need to connect to each others’ customers. Here the problem is collusion between the networks to fix end-user access prices at higher levels.<sup>82</sup>

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<sup>79</sup> Daniel F. Spulber and Christopher S. Yoo, NETWORKS IN TELECOMMUNICATIONS: ECONOMICS AND LAW.

<sup>80</sup> Michael T. Armstrong, *The theory of access pricing and interconnection* (pp. 295-384), in Martin Cave, Sumit K. Majumdar and Ingo Vogelsang (Eds.), HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, VOLUME 1, STRUCTURE REGULATION AND COMPETITION.

<sup>81</sup> *Id.*, p. 297

<sup>82</sup> *Id.*, p. 297

While all forms of access necessarily involve more than one provider, not all access arrangements need to involve the financial compensation. On the internet for example, two interconnecting ISPs may exchange traffic on the basis of a bilateral peering contract, in which traffic in either direction is assumed to be more or less symmetric.<sup>83</sup> But in other cases, access is based on payments from one party to the other. The fact that many instances of access involve monopolistic control of a bottleneck facility, coupled with the possibility of foreclosure or collusion mentioned above make some form of government regulation of access charges necessary.

Vertical interconnection between long-distance and local exchange providers is a specific instance of one-way interconnection. Two types of access charges are involved in this type of interconnection, for call origination and call termination respectively. Currently in the United States access charges are subject to different regimes, based on the several factors: location, type of carrier and type of traffic. Based on the location of call origination and termination, calls are divided into local and long-distance, with the latter further divided into intrastate, interstate and international. Different access charge regimes also apply to calls between incumbent local exchange providers, competitive local exchange providers, long distance carriers, wireless carriers. Finally, access charges also differ based on the type of traffic: wireline voice, wireless voice, and ISP data.

Our focus in this report is on intrastate access charges paid by long-distance companies to local exchange providers for call origination and termination. This is one sub-category within a general set of problems related to telecommunications access and interconnection, around which has emerged an extensive body of economic theory and empirical analysis. The next section details some of the principal ideas in this literature, focusing specifically on one-way access pricing.<sup>84</sup>

## 2.2 Access prices as support for local networks

The practice of recovering a portion of local loop costs from long distance revenues was established after contentious battles in the early history of the pre-divestiture Bell system. Initially, the Bell system had followed the *board-to-board system* of cost allocation by which all the costs of the local loop were recovered from local service. The local switch at the central office was demarcated as the cut-off point between local and long-distance networks, and all the costs on the local side were allocated to local service and on the long-distance side to long-distance. This system was called the board-to-board system, the ‘board’ in this case denoting the switchboard where operators used to route telephone calls to their destination.

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<sup>83</sup> Lippert and Spagnolo have modeled peering arrangement when traffic between interconnecting ISPs is symmetric and asymmetric. They argue that, bilateral asymmetries should not be an incentive for bilateral peering since the asymmetries tend to balance each other out when ISPs form a closed network. Steffen Lippert and Giancarlo Spagnolo, *Internet peering as a network of relations*. TELECOMMUNICATIONS POLICY, 32, 2008, pp. 33-49.

<sup>84</sup> The discussion in the section below is based upon Michael T. Armstrong, *supra* note 80; Corcoubetis and Weber, PRICING COMMUNICATIONS NETWORKS; and Spulber and Yoo, ECONOMICS OF COMMUNICATIONS NETWORKS.

But this system soon came to be challenged in the courts, and was eventually dismantled through a Supreme Court decision. The case came about when the Illinois Commerce Commission, the public utility regulator with jurisdiction over the city of Chicago, passed an order in August, 1923 reducing the rates that local customers would pay for four different categories of coin-box service. The Illinois Bell Telephone Company, the local service subsidiary of the Bell System, went to court challenging the order. Eventually, the case ended up before the Supreme Court of the United States (*Smith v. Illinois Bell*, 1930). The Court ruled that the cost allocation system practiced under the board-to-board system was unfair, because the local loop was used by both services while its costs were supported by local service alone. The costs of the commonly used plant should be rightfully recovered from all the services that used it. While the Supreme Court recognized the difficulties of exactly determining what proportion of local loop costs was used for local and long-distance service, it argued that “extreme nicety is not required, only reasonable measures.” Some application of the principle of *relative use* could be used, to apportion the costs of commonly used facilities between local and long-distance service.

With the board-to-board system now rejected by court order, the Bell system implemented a new pricing program in which the whole network, from the caller’s telephone device to the receiver’s was recognized as one integrated system. This was called the *station-to-station system*; here, ‘station’ meant the user’s telephone set. The costs of the entire system, inclusive of local exchange and toll lines, need to be recovered from the revenues of all *jointly-produced services*. Key to the station-to-station system was the formulation of a rational and easy-to-implement revenue transfer formula, which would support part of the local loop costs from long-distance revenues. This was accomplished through an elaborate revenue sharing arrangement that came to be called *separations and settlements*. Under this, the long-distance company (effectively the Long Lines division of the Bell system) would collectively transfer a part of its revenues to the local exchange companies to compensate the latter for long-distance customers’ use of the local loop to originate and terminate toll calls. These transfer payments from long-distance to local service were called *separations*.

However, there was no guidance in the Supreme Court’s *Smith v. Illinois Bell* decision about the precise proportion of the transfer payments. So, the Bell system initiated a series of negotiations with the local exchange companies to determine what would be appropriate payments from long-distance to local. Since the majority of local loop lines were owned by the Bell system itself through their local exchange subsidiaries, this was accomplished through internal *division of revenues* between Bell Long Lines and the Bell-controlled local exchange companies. With unaffiliated, non-Bell owned local exchange companies (the ‘independents’) these transfer payments were contractually determined.

With the idea of transfer payments from long-distance service to local exchanges firmly established, a *Separations Manual* was produced in 1947 collaboratively by the FCC and the National Association of Railway and Utility Commissioners (NARUC), an organization representing state regulators. The key principle to emerge during this period was that of the *subscriber line usage* (SLU) factor, the relative proportion of local loop usage devoted to local and long-distance. The costs of the local loop were supposed to be allocated according to the SLU factor—however, this proved to be difficult to measure in practice, though perfectly sound in theory. Gradually, the percentage of local loop costs paid for by long-distance revenues

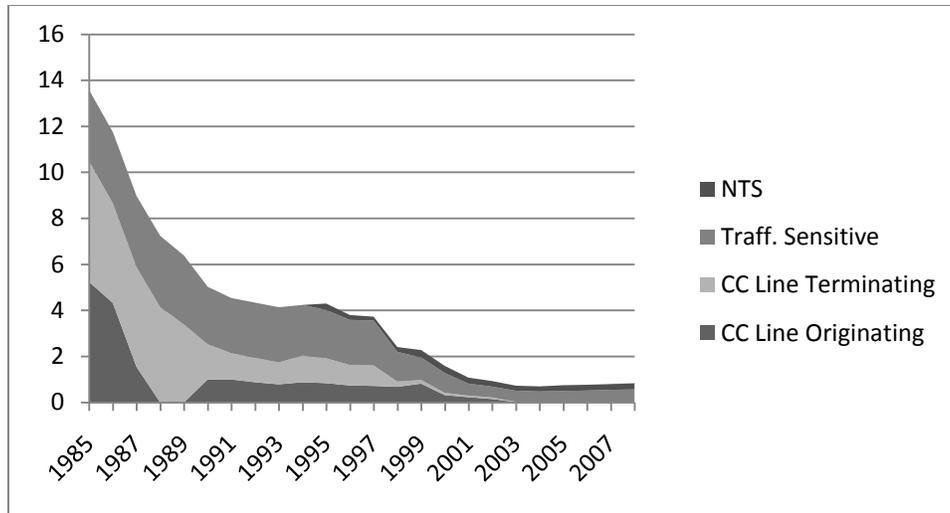
continued to increase. In 1951, under pressure from Congress to keep local rates low, the FCC revised the separations formula to further increase this percentage—this agreement was called the *Charleston Plan*. However, the percentage of local loop costs recovered from long-distance service continued to be low: indeed, this percentage was less than 3% as late as 1965. But beginning in 1965, regulators began to decisively increase the cross-subsidies from long-distance to local service. In 1971, the *Ozark Plan* replaced the SLU with a much more complicated formula, which increased the proportion of the costs of the *non-traffic sensitive* (NTS) plant allocated to long-distance service. The term, non-traffic sensitive plant itself was an invention of the Ozark Plan, but it was roughly equivalent to what we would call the common costs—it included the costs of the local loop itself, plus the central office main distribution frame (the switch), and the local network's connection into the switch.

In the post-divestiture period, these cross-subsidies from long-distance to local were no longer internal transfer payments within the Bell systems. To continue supporting the local loop while not discriminating against any of the competitive long-distance carrier, the interstate portion of the local loop cost allocation was recovered through a per-minute Carrier Common Line Charge, recovered from long-distance carriers for call origination and termination.<sup>85</sup> However, a large portion of this cost-allocation was for Non Traffic Sensitive (NTS) cost elements; it was therefore considered to unfair to collect these charges through per-minute rates, effectively requiring high-volume long-distance users to subsidize low-volume users. Therefore, beginning in 1985, a new recurring monthly Subscriber Line Charge (SLC) (also called an end user common line charge or customer access line charge) was instituted, paid directly by end-use customers to their local exchange providers. Local companies were allowed to recover the remaining NTS costs from long-distance carriers in the form of monthly, per-line charges called Presubscribed Interexchange Carrier Charges (PICCs). Over time, the PICC was eliminated, and the shortfall was recovered through modest increases in the SLC.

Over time, the per-minute access charges for interstate telephone calls has shown a steady decline, according to data in the FCC's *Trends in Telephone Service, 2008* report. In 1985, the total interstate access charges were 17.26 cents per minute; in 2008, the last year for which data are available, this was 1.71 cents, a cumulative decline of 90.1 percent which annualizes to a rate of 2.3 percent per year over 23 years.

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<sup>85</sup> Steve G. Parsons, *The economic necessity of an increased Subscriber Line Charge (SLC) in telecommunications*, ADMIN. LAW REV., 48, 1996, 228,250.



Source: Compiled by authors from data in Table 1.2, Trends in Telephone Service, 2008, FCC.  
 Note: Prior to 1995, NTS charges were not broken down separately, but included in traffic sensitive charges.

Figure 2.1: Interstate long-distance access charges (per minute) and sub-components, 1985-2008

While access charges originated as a means of continuing cross-subsidy support to local networks in the immediate aftermath of the 1984 divestiture, they have continued into the competitive environment unleashed by the 1996 Telecommunications Act. But there is an increasing recognition that access charges have to be reflective of the underlying costs of providing service. The downward movement in interstate access charges is a reflection of this realization.

### 2.3 Theory of access pricing

One-way access involves the provision by an incumbent provider, often a monopoly, of a service that is essential to another network provider in an upstream or downstream market for reaching its own customers. The problem of pricing such services is so contentious that it has often been characterized as the *access pricing dilemma*. On the one hand, as discussed above, there is the opportunity for the supplier of such services to foreclose entry to the upstream or downstream markets by pricing the services at prohibitive levels. This is especially true if the incumbent provider itself is vertically integrated, that is competing with the buyer of such services in the upstream or downstream market. On the other hand, pricing such access services too low can result in inefficient entry into the related market, not to speak of constituting a subsidy from the incumbent to the upstream or downstream provider. As Armstrong has shown, a firm can profitably enter a market even when it is not socially desirable to do so, if certain cost and utility considerations are met; under other conditions, not enough entry occurs even when it is socially desirable.

Let  $P$  and  $C$  are respectively the price charged by the incumbent and its cost,  $c$  the entrant's cost,  $U$  the utility enjoyed by consumers accessing the incumbent's product and  $u$  the utility from the entrant's. The private incentive of the entrant and the socially optimal are aligned only if  $P = C$ , that is the price charged by the incumbent is exactly equal to its costs. But if  $P \neq C$ , profitable but socially undesirable entry can occur. If  $P > C$ , the entry will be profitable but socially undesirable when:

$$P \geq c + [U - u] \geq C$$

But if  $P < C$ , as when regulatory requirements lower the prices charged for the service below the cost of providing them, not enough entry occurs. Specifically, entry would be socially desirable but does not occur in the zone where:

$$P \leq c + [U - u] \leq C$$

In theory therefore, the role of the access price is to adjust the costs of the entrants in such a manner that high-cost firms are deterred from entering, even as efficient firms can profitably enter the market. A number of approaches to the determination of access prices have been proposed, some meeting this basic criterion better than others. The models of determining access charges fall primarily into these five categories (we quote):<sup>86</sup>

- Charges based on the incumbent's retail prices ('retail minus')
- Efficient Component Pricing Rule (ECPR)
- Cost-based access charges
- Capacity-based charges
- Price-cap regulation

In the following paragraphs, these approaches are examined one by one.

### 2.3.1 Retail-minus pricing

This has been defined as the practice of identifying wholesale rates for access customers based on the incumbent's retail rates for the same service, less the incumbent's avoided retail cost and then adding any access specific costs.<sup>87</sup> A formal expression for the retail-minus pricing model is as follows:<sup>88</sup>

$$\begin{aligned} \text{Access price} &= \text{additional marginal cost of interconnection (access)} \\ &+ (\text{Retail price} - \text{marginal cost of retail}) \end{aligned}$$

<sup>86</sup> Ralf Dewenter and Justus Haucap, ACCESS PRICING: THEORY AND PRACTICE, 2007. See p. 10.

<sup>87</sup> Dewenter and Haucap, supra note 86. See also OFTEL, *Direction to resolve a dispute between BT, Energis and Thus concerning xDSL interconnection at the ATM switch*, 21 June, 2002 available from <http://www.ofcom.org.uk/static/archive/oftel/publications/broadband/dsl/atmi0602.pdf>

<sup>88</sup> ITU InfoDev, *ICT Regulation Toolkit*, 2007, available from <http://www.ictregulationtoolkit.org/en/index.html>. See specifically Section 3.3.1, Pricing principles.

While this method is similar to the Efficient Component Pricing Rule (ECPR) (see below), it is different in the sense that retail-minus does not include an opportunity cost component. The United Kingdom's Office of Telecommunications has described the conditions under which retail-minus access pricing method might be appropriate: first, it is applicable when access markets are not yet competitive, but the incumbents' market power is not likely to persist; second, where the provision of access services requires investment in risky assets; and third, where significant uncertainty exists regarding the future development of a market due to untested technologies or competing standards. Retail-minus as a pricing standard has attracted much more attention in Europe than in the United States, where it has been advocated for interconnection pricing between xDSL services.<sup>89</sup> While easy to administer, the retail-minus method has been criticized because it allows an excessive retail price set by an incumbent with significant monopoly power to feed into excessive wholesale prices as well.<sup>90</sup>

### 2.3.2 The Efficient Component Pricing Rule

The ECPR was proposed by two economists William Baumol<sup>91</sup> and Robert Willig<sup>92</sup> in separate proposals. It is sometimes called the parity pricing rule or the Baumol-Willig rule, after the two originators of the idea. The ECPR states that the incumbent should charge an access price that does not exceed the actual average incremental cost of providing access plus its opportunity cost in the competitive segment.

The ECPR is most applicable to a competitive situation where a vertically integrated incumbent telecommunications provider provides access services to a competitor in either the upstream or downstream segments. The incumbent generates local loop service at an average incremental cost of  $C_I$ , and provides it to customers at a price of  $P_I$ .<sup>93</sup> It costs the incumbent an average incremental cost of  $C_0$  to modify its system to provide access. Finally, the average incremental local loop cost of the new entrant is  $C_E$ , and its price of service is  $P_E$ . The access price according to ECPR will be a price  $A$  low enough to permit competitors to enter the market, but high enough to prevent inefficient (high cost) suppliers from coming into the market.

To derive this access price, we begin by noting that for entry to be socially optimal, the costs of the entrant have to be such that the entrant's total costs of entry, including its own local loop costs plus the incumbent's costs of enabling access should be lower than the incumbent's cost of providing the equivalent service [ $C_0 + C_E < C_I$ ]. For a competitor to be price-competitive with the incumbent, the maximum price that the entrant can charge, and still hope to attract customers

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<sup>89</sup> Ricardo Goncalves, *Cost orientation and xDSL services: Retail-minus vs. LRAIC*, TELECOMMUNICATIONS POLICY, 31 (8-9), 2007, pp. 524-529

<sup>90</sup> Dewenter and Haucap, supra note 87.

<sup>91</sup> William J. Baumol, *Some Subtle Issues in Railroad Deregulation*, 10 INT. J. OF TRANS. ECON. 341 (1983); William Baumol and Gregory Sidak, TOWARD COMPETITION IN LOCAL TELEPHONY, 1994; William J. Baumol and Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, YALE J. REG. 171 (1994).

<sup>92</sup> Robert Willig, *The theory of network access pricing*, in H. M. Trebing (ed.), ISSUES IN PUBLIC UTILITY REGULATION, 1979, PP. 109-152.

<sup>93</sup> Average incremental costs refer to the total service specific fixed and variable costs averaged over the total units of output supplied. The prices likewise are per unit costs: in this case, the local subscription price charged to each customer.

away from the incumbent is the incumbent's own price,  $P_I$ . That is, the entrant's price  $P_E$  has to be less than or at least equal to the incumbent's price  $P_I$  [ $P_E < P_I$ ]. Also, since the entrant's total cost includes the access price it has to pay to the incumbent as well as its own local loop costs, to break even the entrant's price has to be more than the sum of the access cost and its own local loop cost [ $P_E > A + C_E$ ].<sup>94</sup> Under the ECPR, access prices are based upon the actual costs of providing access, plus the opportunity cost to the incumbent [ $P_I - C_I$ ]. Thus  $A = C_0 + P_I - C_I$ .<sup>95</sup> It can be shown that the ECPR-based access price allows only efficient entry.<sup>96</sup>

Many criticisms of the ECPR have been put forward. First, it uses the incumbent's costs and prices as the datum against which to measure the efficiency of the new entrants implicitly assuming that these original costs were efficient, and that the prices were fair. In reality, monopolies often inflate their costs and prices—by using the incumbent's prices as the basis for ECPR we may be perpetuating the pricing advantages of the existing operators. Second, the ECPR is based upon average incremental costs neglecting the common costs. Third, ECPR discounts the possibility that the incumbent would not discriminate against new entrants using other mechanisms besides price. Finally, we assume that telecommunications service markets are homogeneous, ie. The incumbent's and entrants' products are perfect substitutes.<sup>97</sup> Because of these criticisms, the ECPR in its pure form is no longer used to set prices for telecommunication services. Instead modifications of the ECPR that incorporate elements or Ramsey pricing or the various versions of TELRIC are used.

### 2.3.3 Cost based access pricing

Basic economic theory suggests that in perfectly competitive markets, producers should set prices at levels equaling their marginal cost of production in order to maximize profits. However, in the case of telecommunications, this is often not possible because of high fixed (sunk) costs and strong economies of scale. Pricing at marginal cost in these circumstances will not allow the service-provider to recover the fixed infrastructure costs. Various other models that price services at higher-than-marginal cost have been proposed over time.

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<sup>94</sup> It is easy to see that the incumbent will be able to prevent any competitor from coming into the market by setting an access price  $A$  greater than  $P_I - C_E$ . [ $A > P_I - C_E$ ]. Obviously, the incumbent should not be allowed to set such high access prices. But at the other extreme, free access [ $A = 0$ ], or an access price equal to the cost of providing access [ $A = C_0$ ] many not be able to prevent entry by new firms whose cost of providing local loop service is lower than the incumbent's.

<sup>95</sup> Armstrong, op cit footnote 80 formalizes this slightly differently as  $A = C_0 + \sigma \cdot [P_I - C_I]$ , where  $\sigma$  is a measure of the substitutability of the incumbent's and entrant's products. In other words it is an indicator of the number of units of the incumbent's product in the competitive segment that is lost when one access unit is provided to the competitor. For non-differentiated products, we may assume that  $\sigma = 1$ , resulting in the simpler formulation in the main text.

<sup>96</sup> If the new entrant needs to break even, the minimum price it can charge will be  $= A + C_E$ . [ $P_E \geq A + C_E$  or  $P_E \geq C_0 + P_I - C_I + C_E$ , substituting the ECPR-based access price,  $A$ ]. We can modify this to give:  $P_E \geq P_I + \{C_0 - C_I + C_E\}$  But we also know that in order for the new entrant to draw customers away from the incumbent, the highest local service price that the new entrant can charge is  $P_I$  [ $P_E \leq P_I$ ]. This implies that  $C_0 - C_I + C_E \leq 0$  or  $C_0 + C_E \leq C_I$ , which satisfies the efficiency criterion discussed above.

<sup>97</sup> Dewenter and Haucap, supra note 86.

Two alternative modes of recovering fixed costs are usage-proportional markups and price-proportional markups.<sup>98</sup> Both methods begin with an exhaustive identification of all costs in the system and their attribution to different services. Those costs that can be allocated to specific services on a cost-causation basis constitute the separable costs (further divided into service-specific fixed costs and variable costs). But in any multiple service network, this still leaves common costs that cannot be fully assigned to any particular service. Under usage-proportional markups, these common costs are assigned to the usage units of all the services equally: for example, averaged over the sum of all local and long-distance minutes. Under price-proportional markups, the common costs are assigned to different services as a markup that is proportional to the marginal costs of each service. Both methods ensure that all costs are recovered from the set of services offered, allowing the system to be free of external subsidies. Under both of these methods, long-distance access charges are allowed to be higher than the local exchange-company's marginal cost of providing access services: the markups allow the recovery of a part of the common costs of the system

One criticism of usage- and price-proportional markups is that they do not take into account the demand conditions confronting different services. While any departure from marginal cost pricing creates deadweight losses, this effect is relatively less when demand is inelastic because the change in price leads only to a smaller change in demand. When confronted with a need to raise a certain revenue from multiple services (for example, in order to break even, or to realize a permitted rate of return) it is socially optimal to increase prices for inelastic products/services. Ramsey pricing has been advocated as a means of achieving this goal. Also called inverse elasticity pricing, Ramsey pricing sets the prices  $[p_k]$  for a set of goods  $k$  with marginal costs  $c_k$  and elasticities  $\varepsilon_k$  such that:<sup>99</sup>

$$\frac{p_k - c_k}{p_k} = \theta \cdot \frac{1}{\varepsilon_k}$$

where  $\theta$  is a constant of proportionality<sup>100</sup> common to all goods  $k$ .

Another alternative is to price output at incremental cost rather than marginal cost. Long Run Incremental Costs (LRIC) consider an entire service or class of services as the increment, thereby including the service-specific fixed costs too to be recovered from consumers: the price will be set equal to the average incremental cost of the entire service. The long term assumption in LRIC also allows the costs of periodic capacity addition to be considered as a variable cost, thus including it in the incremental cost pool as well.

### 2.3.5 Capacity based charges

Capacity-based charges are a form of two-part tariff in which there is a fixed charge for a certain capacity available to a specific user and a per unit variable charge that depends on the actual

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<sup>98</sup> Jean-Jacques Laffont and Jean Tirole, *COMPETITION IN TELECOMMUNICATIONS*, 2000. See specifically, Chapter 4, Essential facility and one-way access: Policy.

<sup>99</sup> Id., Laffont and Tirole.

<sup>100</sup> More specifically,  $\theta = \lambda$ , where  $\lambda$  is the shadow price, the Lagrangian multiplier for the balanced budget constraint in the welfare maximization equation.

usage: if usage is within the capacity limit allocated to the customer, the per unit variable cost is the marginal cost, but if capacity is exceeded, a second usage fee is applied that is set high enough to be deterrent.<sup>101</sup> The objective is to limit overconsumption, and is specifically applicable to industries that have high sunk investments. This form of access pricing is used in gas transmission and in certain European telecommunications markets.

### 2.3.6 Price-cap charges

Confronted with the difficulties of operating traditional rate-of-return regulation in a competitive telecommunications environment, many regulators have opted for various forms of price caps as a means of allowing a degree of pricing flexibility to service providers while protecting consumers and competitors against any residual market power. In the United States, the FCC initiated a price cap plan for access pricing beginning in 1991.<sup>102</sup> The economic theory behind price caps has been explored by many economists; fundamentally, the theory argues that price caps can simulate open market competition by restricting a firm to zero profits by setting the growth rate of its output prices to the rate of increase of its input prices, adjusted for any change in the firm's productivity.<sup>103</sup>

The FCC's 1991 plan capped the annual increase in access prices at the price cap index (PCI), which consisted of three components; first, a measure of inflation; second, a productivity offset reflective of the historical increase in productivity in the overall economy (which came to be called the X-factor); and third an adjustment for exogenous factors affecting the production costs of access services, for example a change in state tax rates. Initially, the productivity offset was determined to be 3.3 percent per year.<sup>104</sup> The FCC's 1991 price cap plan also included an earning sharing component, to incentivize efficient production practices. According to this, the provider is allowed to keep all profits resulting from cost efficiencies up to a certain return threshold; any profits in excess of this are shared with customers in a predetermined ratio.<sup>105</sup>

An alternative to simple price caps applicable only to one product or service is a global price cap in which the intermediate good (access) is considered as only one part of the incumbent firm's portfolio of outputs and the whole portfolio is regulated under a price cap. A 'global price' is defined as the weighted average of all the goods produced by the firm and included under the price cap, where the weights are the respective quantities produced. The global price is then subject to a maximum level determined by the regulator. Laffont and Tirole have shown that

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<sup>101</sup> Dewenter and Haucap, *supra* note 86.

<sup>102</sup> Noel D. Uri and Florence O. Setzer, *Assessing the performance of the price cap plan for local exchange carriers in the United States*. 2003, 15 EUROPEAN JOURNAL OF LAW AND ECONOMICS, pp. 263-276.

<sup>103</sup> Jeffrey I. Bernstein and David E. Sappington, *Setting the x-factor in price cap regulation plans*. 16 JOURNAL OF REGULATORY ECONOMICS, 1999, PP. 5-25.

<sup>104</sup> Uri and Setzer, *supra* note 102; see also Robert Loube, *Price cap regulation: problems and solutions*, 71(3) LAND ECONOMICS, 1995, PP. 286-298.

<sup>105</sup> David Sappington and Dennis Weisman. *A review of existing regulatory plans*. In DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY, 1996. pp. 71-98.

under global price caps, the regulator firm is induced to choose Ramsey-optimal (inverse-elastic) price for all its products.<sup>106</sup>

## 2.4 Economic modeling of access charge reductions

The effect of any departure from marginal cost pricing is well-known in the economics literature, and has been applied to the general case of universal service subsidies by many authors.<sup>107</sup> Others including Hausman, Prieger and Riordan have looked at the specific case of long-distance access charges.<sup>108</sup> But while these authors attempt to quantify the overall welfare losses from the presence of access charges, they do not compare the different welfare gains that may result from the reduction of access charges to different benchmarks. The following model follows the general outline laid out by these authors, specifically Riordan. The thrust of the argument is that any increase in price above marginal cost results in a deadweight loss, and is economically inefficient; by extension, any reduction in access charges has the potential to lower long-distance prices and would result in a reduction in this deadweight loss. The magnitude of this gain is dependent on the price elasticity of demand as well as the percentage reduction in long-distance prices as a result of access charge reduction. We then apply the model equations to two different cases: in case one, each rural local exchange carrier (RLEC) in Pennsylvania establishes parity between its own intrastate and interstate rates; in case two, all RLECs move their intrastate access charges to the average federal interstate access charge.

To model the efficiency gains, we assume a constant elasticity demand function [ $Q(p) = k \cdot p^{-\varepsilon}$ , where  $Q(p)$  is the demand as a function of price, and  $\varepsilon$  is the price elasticity]. The initial price for long-distance and the number of usage minutes are  $p$  and  $Q$  respectively. The long-distance carrier pays an access charge of  $A$  to the local loop provider. For ease of exposition, we assume the marginal cost of long-distance service is zero. We also assume that any access charge reduction  $\Delta A$  is passed on fully to consumers (pass-through percentage = 100%),<sup>109</sup> with the result that the final price becomes  $p - \Delta A$ , and as a consequence the final usage is  $Q + \Delta Q$ .

Figure 2.2 shows these changes graphically.

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<sup>106</sup> Jean-Jacques Laffont and Jean Tirole, *Creating competition through interconnection: Theory and practice*. 10 JL. OF REGULATORY ECON., 1996 pp. 227-256.

<sup>107</sup> For example, see Jerry Hausman & Howard Shelanski, *Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies*, 16 YALE JL ON REGULATION 19, 36-37 (1999); Robert W. Crandall & Leonard Waverman, WHO PAYS FOR UNIVERSAL SERVICE, 2000.

<sup>108</sup> Jerry Hausman, *Economic welfare and telecommunications regulation*, 16 YALE JL. REGULATION, 19-51; James Prieger, *Universal service and the Telecommunications Act of 1996*, 22 TELECOM. POLICY, 57-71; Michael H. Riordan, *Universal residential telephone service*, (pp. 423-473), in Martin Cave, Sumit K. Majumdar and Ingo Vogelsang (Eds.), HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, VOLUME 1, STRUCTURE REGULATION AND COMPETITION.

<sup>109</sup> This is not an unreasonable assumption to make since it has been found that reductions in access payments have translated into lower end-user toll revenues. William E. Taylor and Lester D. Taylor, *Post-divestiture Long-Distance Competition in the United States*, 83(2) AM. ECON. REV. 1993, pp. 185-190; William E. Taylor and J. Douglas Zona, *An Analysis of the State of Competition in Long-Distance Telephone Markets*, 11 JL. OF REGULATORY ECON., 1997, pp. 227-255.

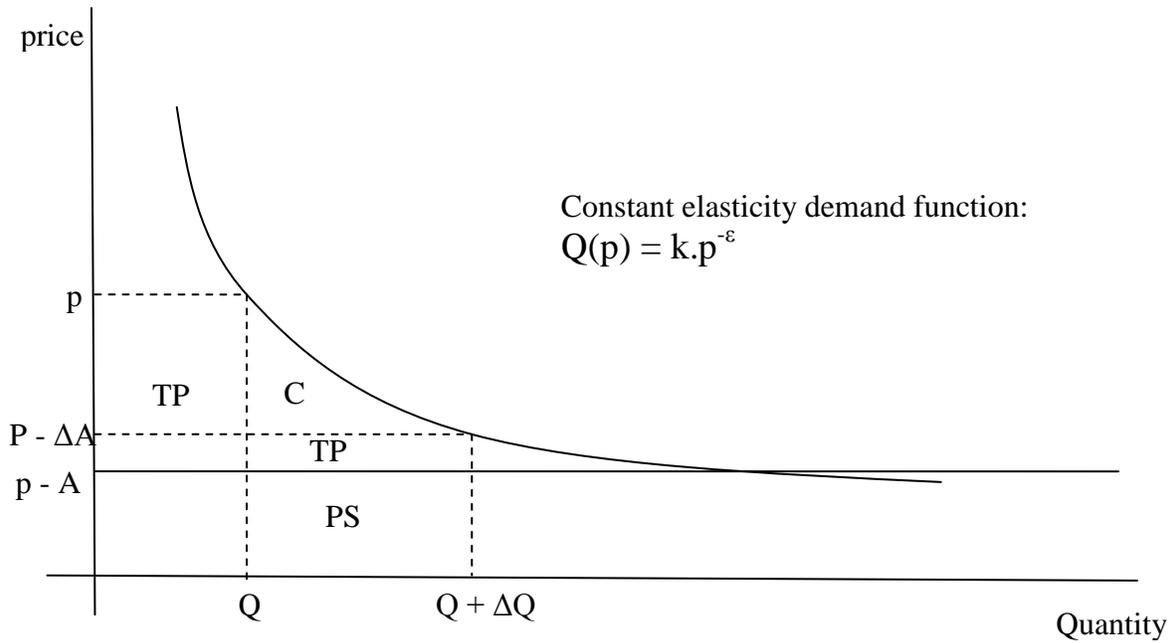


Figure 2.2: Effect of access price reduction on social welfare

A long-distance price change resulting from an access charge reduction has three distinct effects. First, there is a gain in producer surplus resulting from an increase in consumption (this is represented by the rectangle labeled PS in Figure 2.  $[\Delta PS = (P - A) \cdot \Delta Q]$ ). The second change is an increase in consumer surplus resulting from an expansion in consumption. This is the area bounded by the two price lines and the demand curve. In Figure 1, this will be the sum of the areas marked by  $TP_1$  and CS [increase in consumer surplus =  $TP_1 + CS$ ]. The third effect is the change in the access revenue to local loop providers: even as local loop providers are losing revenue equal to  $TP_1$ , they are gaining access revenue (but at a reduced rate) from new usage resulting from the access charge reduction. Thus, the net change in access revenue will be a loss the difference between the two [change in local access revenue =  $TP_2 - TP_1$ ].

To quantify these changes, we begin with the constant elasticity demand function:

$$Q(p) = k \cdot p^{-\epsilon}$$

If  $(p_1, Q_1)$  and  $(p_2, Q_2)$  and the price and minutes of usage before and after an access charge reduction, we have:

$$\frac{Q_2}{Q_1} = \left[ \frac{p_2}{p_1} \right]^{-\epsilon}$$

To obtain the change in demand when prices fall, we can modify this equation as follows:

$$\frac{(Q_2 - Q_1)}{Q_1} = \left[ \frac{p_2}{p_1} \right]^{-\epsilon} - 1$$

$$\frac{\Delta Q}{Q} = \left[ \frac{p - \Delta A}{p} \right]^{-\varepsilon} - 1$$

$$\Delta Q = \left\{ \left[ \frac{p - \Delta A}{p} \right]^{-\varepsilon} - 1 \right\} \cdot Q$$

Thus, the change in demand consequent to a change in access charges is equal to:

$$\Delta Q = \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\} \cdot Q$$

In this formula, notice that the change in quantity demanded is dependent on two ratios: the ratio of access charges to long-distance per minute prices,  $\frac{A}{p}$ ; and the access charge reduction as a percentage of total access charges,  $\frac{\Delta A}{A}$ . The change in producer surplus ( $\Delta PS$ ) can now be directly calculated as  $\Delta PS = (p - A) \cdot \Delta Q$ .

$$\Delta PS = (p - A) \cdot \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\} \cdot Q$$

$$\Delta PS = pQ \left( 1 - \frac{A}{p} \right) \cdot \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\}$$

Turning to the change in consumer surplus, this is the integral of the demand curve between the limits of  $p$  and  $p - \Delta A$ .

$$\Delta CS = \int_p^{p-\Delta A} Q \cdot dp$$

Substituting for  $Q$  from the constant elasticity demand function, we get:

$$\Delta CS = \int_p^{p-\Delta A} kp^{-\varepsilon} \cdot dp$$

$$\Delta CS = \frac{k}{1 - \varepsilon} \cdot [p^{1-\varepsilon} - (p - \Delta A)^{1-\varepsilon}]$$

$$\Delta CS = \frac{kp^{1-\varepsilon}}{1 - \varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{1-\varepsilon} \right\}$$

$$\Delta CS = \frac{pQ}{1 - \varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{1-\varepsilon} \right\}$$

Finally, we can also see that  $\Delta TP$ , the net change in access charge payment to local loop providers is equal to the additional revenue received from a reduced access charge  $[A - \Delta A]$  on new access minutes  $[\Delta Q]$ , less the loss of access charge revenue from the old usage  $[Q \cdot \Delta A]$ . Thus, net change in access charge revenue is equal to  $\Delta TP = (Q + \Delta Q) \cdot (A - \Delta A) - Q \cdot A = \Delta Q \cdot (A - \Delta A) - Q \cdot \Delta A$ . In Figure 1, this will be equivalent to the area  $TP_2$  less the area  $TP_1$  [ $\Delta TP = TP_2 - TP_1$ ]. Substituting for  $\Delta Q$  in the expression, we get:

$$\Delta TP = \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\} \cdot Q \cdot (A - \Delta A) - Q \cdot \Delta A$$

Rearranging, we get:

$$\Delta TP = pQ \cdot \left( \frac{A}{p} \right) \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} \cdot \left( 1 - \frac{\Delta A}{A} \right) - 1 \right\}$$

From the expressions for  $\Delta PS$ ,  $\Delta CS$  and  $\Delta TP$ , we can now calculate the net change in social welfare resulting from the access charge reduction.

$$\begin{aligned} \Delta SW &= pQ \left( 1 - \frac{A}{p} \right) \cdot \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\} + \frac{pQ}{1 - \varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{1 - \varepsilon} \right\} \\ &\quad + pQ \cdot \left( \frac{A}{p} \right) \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} \cdot \left( 1 - \frac{\Delta A}{A} \right) - 1 \right\} \\ \Delta SW &= pQ \left\{ \left( 1 - \frac{A}{p} \right) \cdot \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} - 1 \right\} + \frac{1}{1 - \varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{1 - \varepsilon} \right\} \right. \\ &\quad \left. + \left( \frac{A}{p} \right) \left\{ \left[ 1 - \frac{A}{p} \cdot \frac{\Delta A}{A} \right]^{-\varepsilon} \cdot \left( 1 - \frac{\Delta A}{A} \right) - 1 \right\} \right\} \end{aligned}$$

This expression may be further simplified, for instance by combining similar terms in the expressions for  $\Delta PS$  and  $\Delta TP$ , but we retain the present form because it maintains separation between the three principal components,  $\Delta PS$ ,  $\Delta CS$  and  $\Delta TP$ . With these equations, we can therefore simulate the social welfare gain as a multiple of intrastate toll revenue ( $PQ$ ), for various levels of  $\Delta A/A$ ,  $A/p$  and  $\varepsilon$ .

## 2.5 A note on model inputs

In any simulation, model results will vary significantly based on the values of the critical parameters input into the above equations: specifically: the price elasticity of demand for long-distance telephone service ( $\varepsilon$ ); access charges as a percentage of price ( $A/p$ ); and the percentage change in access charges ( $\Delta A/A$ ). The first, price elasticity ( $\varepsilon$ ) is a ‘exogenous’ variable conditioned on demand characteristics. The second, access charges as a percentage of price is a policy variable determined by past regulatory choices. For current policy choices, it needs to be ascertained through an analysis of data. The third, whether a change in access charge ( $\Delta A/A$ ) needs to be implemented, is the subject matter of the current study. However, we do not have

precise data for intrastate toll price elasticity in the state of Pennsylvania; or for access charges as a percentage of price. These two critical variables are discussed in more detail below.

*Price elasticity ( $\epsilon$ ):* A critical input into the above model is the value of toll price elasticity, specifically for intrastate service. Numerous factors have been identified that affect estimates of price elasticity, including national differences, income and reciprocal calling. Price elasticity may also be an increasing function of price, meaning that demand may be more responsive to changes in price when the original price is high.<sup>110</sup> Though this has been extensively studied in the literature, a precise number (or range of numbers) is yet to emerge.

Source <sup>111</sup>	$\epsilon$
Taylor, 1994	0.7
Taylor & Rappaport, 1997	0.5
Tardiff, 1999	0.2
Kridel, Rappaport & Taylor, 2002	0.44
Ingrahan & Sidak, 2004	0.2
Garin-Munoz & Perez- Amaral, 1998	1.31
Dismukes, 1996	0.54
Das & Srinivasan, 1999	0.58
Average	0.56

Table 2.1: Estimates of price elasticity of demand for toll services

As can be seen from Table 2.1, toll price elasticities have been estimated within a wide range, from a low of  $-0.2$  to a high of  $-1.31$ . Complicating the comparisons is the fact that many of these estimations were carried out before the current era of intense intra- and inter-platform competition in telecommunications when the number of available substitutes for toll service were fewer and less prevalent. Comparisons over the long time-frame show that price elasticity may be declining, as telephone service has come to be regarded as an essential good, rather than a

<sup>110</sup> Robert Fildes and V. Kumar, *Telecommunications demand forecasting—a review*. 18 INTL. JOURNAL OF FORECASTING, 2002, 489-522.

<sup>111</sup> Lester D. Taylor, TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE, 1997. Lester D. Taylor, and Paul N. Rappaport, *Toll price elasticities estimated from a sample of U.S. residential telephone bills*, INFORMATION ECONOMICS AND POLICY, 9(1) 1997, 51-70; Tardiff, T. J. (1999). Effects of large price reductions on toll and carrier access demand in California. In Loomis, D. G., & Taylor, L. D. (Eds.), *The Future of the Telecommunications Industry: Forecasting and Demand Analysis*. Boston: Kluwer Academic, pp. 97–114; Allan T. Ingraham and J. Gregory Sidak, “Do States Tax Wireless Services Inefficiently? Evidence on the Price Elasticity of Demand,” *Virginia Tax Review*, 24, No. 2, (Fall 2004), pp. 257-258; Garin-Munoz, T., & Perez-Amaral, T. (1998). Econometric modeling of Spanish very long distance international calling. *Information Economics and Policy*, 10, 237– 252; David E. Dismukes, The demand for long-distance telephone communication: A route specific analysis of short-haul service. *Studies in Economics and Finance*, 1996, 17(1), 33 – 45; Pinaki Das, P. V. Srinivasan, Demand for telephone usage in India, *Information Economics and Policy*, Volume 11, Issue 2, 1999, pp. 177-194.

luxury.<sup>112</sup> But more recently, as close substitutes such as mobile long-distance, VoIP and email have become increasingly available, it is quite likely that the price elasticity of wireline toll services would have increased. It should also be pointed out that price elasticities for intrastate and interstate long-distance may be different. The closest we come to is a study by Rappaport and Taylor that estimates intrastate toll price elasticity to be  $-0.50$ .<sup>113</sup> Nevertheless, in the absence of more up-to-date data, we will continue to use the average value identified above, ( $-0.56$ ) as an approximation for the price elasticity of intrastate toll service.

*Access charges as percent of toll prices [A/p]:* In addition to elasticity, the other critical input into the model equations is relative proportion of access charges relative to intrastate long-distance prices. Data on long-distance prices and access charges are easily available or can be calculated from data in the FCC's *Trends in the Telephone Industry*. The trend in interstate access charges and interstate long-distance charges is shown in Figure 3.

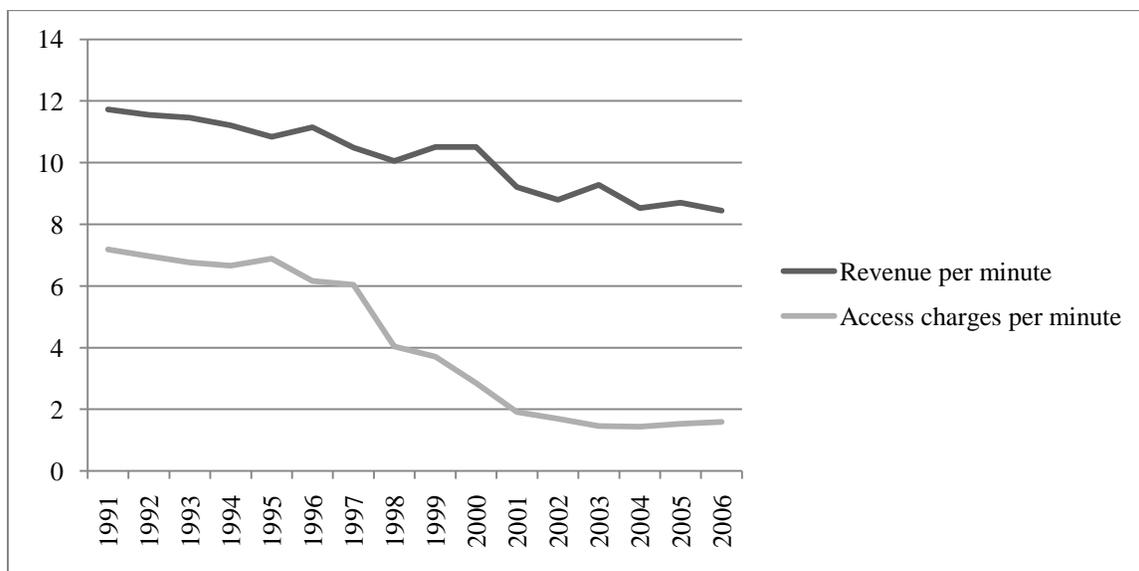


Figure 2.3: Interstate toll revenue per minute and access charges per minute, 1991-2006

In the figure, while both revenue per minute and access charges per minute show a downward trend, the decline in access charges is more steep, with the result that the ratio of access charges to toll prices [A/p] declined from 0.61 in 1991, to 0.19 in 2006, the last year for which data are available.<sup>114</sup> This trend has been previously documented by Jerry Ellig.<sup>115</sup>

<sup>112</sup> Lester D. Taylor, TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE, 1994. See also, Lester D. Taylor, *Customer demand analysis*, (pp. 97-142), in Martin Cave, Sumit K. Majumdar and Ingo Vogelsang (Eds.), HANDBOOK OF TELECOMMUNICATIONS ECONOMICS, VOLUME 1, STRUCTURE REGULATION AND COMPETITION.

<sup>113</sup> Taylor, and Rappaport, *supra*.

<sup>114</sup> All interstate interexchange carriers were required to file their long-distance rates tariffs with the FCC up until August 2001, and were made available for public inspection at the FCC's Reference Information Center, Washington, DC. Since then, the filing requirement was eliminated and interstate carriers are only required to post their rates on their websites. For Figure 3, the revenue per minute was calculated with the aggregate interstate toll revenue data in Table 9.2 of the FCC's *Trends in the Telephone Industry*, with the minutes of long-distance usage in Table 10.2 of the same report. Interstate access charge data was available from Table 1.2 of the same report.

Comparable data on intrastate access rates are not available. Anecdotal data suggests that intrastate access rates are higher than interstate rates, as much as 36 cents per minute in some state jurisdictions.<sup>116</sup> For Pennsylvania, selected data is available from AT&T's filings in regulatory proceedings with the PUC.

	Access lines in PA  [1] #	Intrastate toll price  [2] cents/min	Co. Intrastate access charge [1] cents	Access charge to price Ratio =A/p
Century Link/Embarq	291186	9.01	4.76	0.528
Frontier	303220	9.01	5.92	0.657
Windstream/D&E	307411	9.01	3.70	0.411
Consolidated/North Pitt	11102	9.01	4.40	0.488
Weighted Avg. big-4 RLEC [3]	912919	9.01	4.78	0.531

NOTES

[1] Data compiled from RLEC filings with Pennsylvania PUC.

[2] National average intrastate toll price is an estimate = 9.01 c/min (Intrastate toll revenues from Table 9.2, divided by total intraLATA intrastate minutes, both from Trends in Telephone Service, 2008, FCC)

[3] Intrastate access charge is a weighted average using number of access lines as weight

Table 2.2: Estimating the access charge to intrastate long-distance price for rural LECs in Pennsylvania

Using available data, we prepared an estimate of the percentage of intrastate long-distance prices accounted for by access charges for the rural LECs in Pennsylvania. Using data from the FCC's *Trends in Trends in Telephone Service* (August 2008), we divided total U.S. intrastate toll revenues by total intrastate interLATA billed access minutes to obtain an average intrastate long-distance price of approximately 9.01 cents per minute. Each company's intrastate access charges available from AT&T's regulatory filings was then used with this information to calculate an A/p ratio. A weighted average access charge for all four RLECs was also calculated, using the number of access lines as the weight. The A/p ratio for all 4 RLECs worked out to 0.531. In other words, approximately 53 percent of the long-distance price for RLEC-originated or -terminated intrastate long-distance calls went to access charges.

<sup>115</sup> Jerry Ellig, *Intercarrier compensation and consumer welfare*. Mercatus Center, George Mason University, available at <http://www.mercatus.org/PublicationDetails.aspx?id=17794>

<sup>116</sup> *Id.*, Ellig.

## 2.6 Estimating welfare gains from lower access charges

Using the parameter values estimated above, we can graph the entire range of possibilities of access charge reductions,  $0 \leq \Delta A/A \leq 100\%$ , ranging from no change in access charges to complete elimination. It may also be noted that the vertical axis represents multiples of intrastate toll revenue [ $pQ$ ]. It may be noted that long-distance producer surplus and consumer surplus both increase with higher access charge reductions. Transfer payments to local-loop providers are reduced.

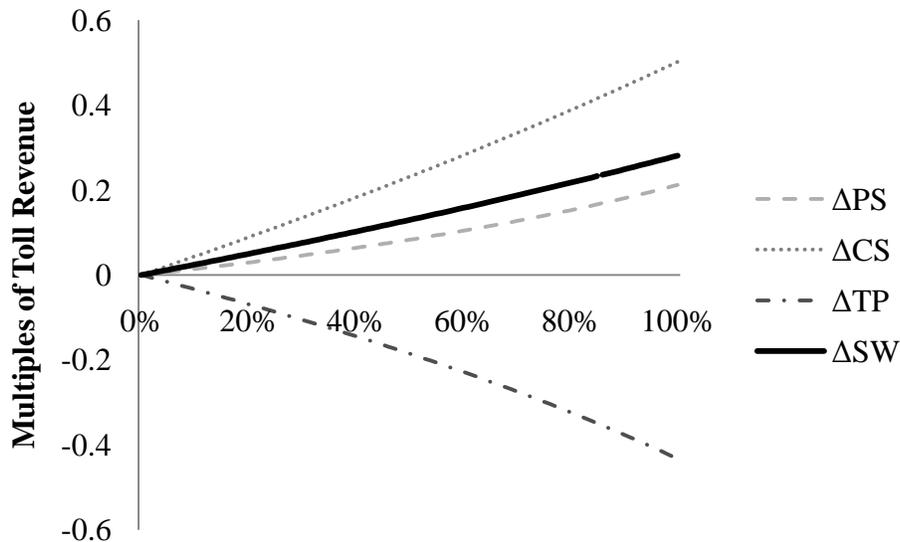


Figure 2.4: Simulation of net change in social welfare (with sub-components) with access charge reduction (%) ( $\Delta A/A$ ), for hypothetical case where  $A/p = 53\%$ ,  $\varepsilon = -0.56$

The impact on local providers is worthy of further examination. As noted above, local exchange providers lose access revenue from a reduction in access charges, but this effect is mitigated by the addition of access revenue from new call minutes, since price reductions are stimulative of demand. In fact, it is even possible that the revenue-enhancing effect of new demand could overwhelm the lost revenue from access charge reductions on existing usage if price reductions are strongly stimulative of new demand: that is, when price elasticity is high. The threshold value is  $\varepsilon = 1$ .

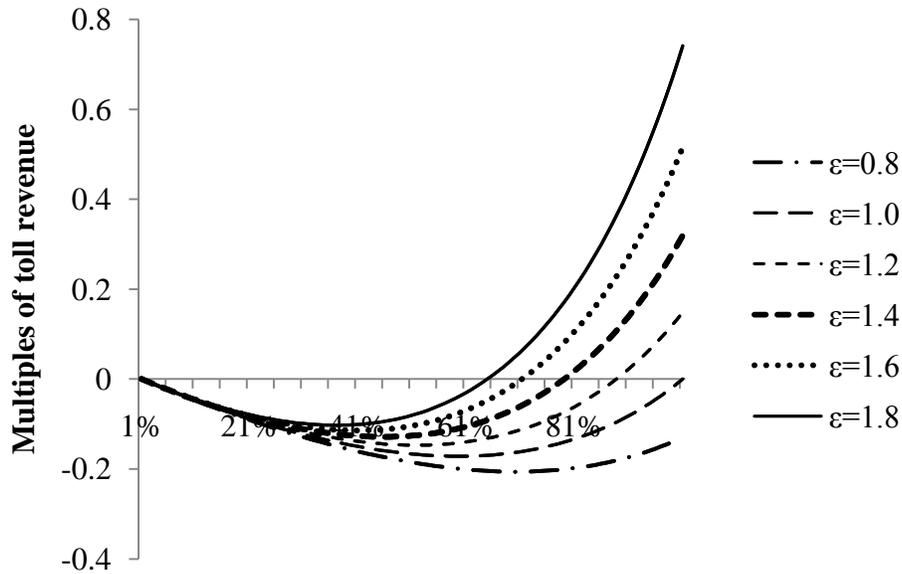


Figure 2.5: Change local-loop provider's access revenue for a 50 percent reduction in access charges ( $\Delta A/A = 0.5$ ), for different values of price elasticity and  $A/p$ .

In Figure 2.5, we have represented the change in local loop access revenue for a 50 percent reduction in access charges, for various levels of elasticity. The horizontal axis represents  $A/p$ , the proportion of long-distance prices accounted for by access charges. If access charges represent a large share of long-distance prices, access charge reductions increase access revenues to local-loop providers. The threshold of  $A/p$  where access charge reductions become beneficial to local loop providers is lower when the elasticity is higher. For example, at  $\epsilon=1.2$ , local loop providers will benefit from a 50 percent reduction in access charges if access charges currently account for 88% or more of long-distance prices. If elasticity is 1.4 instead, this reached when access charges are 79% or more of long-distance prices. Notice that at  $\epsilon=1.0$ , a 50% reduction in access prices is beneficial to the local-loop provider only if the access charge accounts for *all* of the long-distance price ( $A/p=1.0$ ). But note too that even here, an access charge reduction is harmful only to the local-loop provider: since the long-distance provider and consumers benefit to a greater extent, the net change in social welfare is positive. Though high price elasticity greater than 1 [ $\epsilon > 1.0$ ] was only noted in one of the empirical analyses reviewed for this report, it is likely that with the greater availability of close substitutes, the price elasticity of long-distance service may increase. But since this is speculative, we persist with the more conservative estimate arrived at earlier, namely  $\epsilon = -0.56$ .

With these inputs we now turn to an estimation of the total welfare gains resulting from the reduction of access charges in Pennsylvania to three benchmarks. In Case I, we calculate the net gains (disaggregated by  $\Delta PS$ ,  $\Delta CS$  and  $\Delta TP$ ) from a reduction of each major RLEC's intrastate access charges to the levels each RLEC currently charges for interstate origination and termination. In Case II, we calculate the changes resulting from a uniform reduction of all RLEC's intrastate access charges to the national average interstate access charge (equal to 1.71 cents per minute in 2008). In Case III, we report the results of a reduction of each company's intrastate access charges to the level currently charged by Verizon for intrastate access. The results are presented in Table 2.3.

Local Exchange Companies in Pennsylvania fall into three groups. The first group comprises the so-called “big-4” rural LECs (Century Link/Embarq, Frontier, Consolidated/North Pitt, and Windstream/D&E). These four companies service 17.4 percent of all local loops in the state. The second group is the smaller, unaffiliated local telephone companies, which together provide 2.1 percent of all lines. The third ‘group’ is Verizon, which serves 80.4 percent of lines. Since the smaller unaffiliated carriers account for only a very small percentage of all local loop lines and access revenue, and Verizon’s access charges are not part of the regulatory proceedings, we will focus the discussion on the ‘big-4’ RLECs.

In the three simulations, annual gains and losses are calculated for long distance providers, consumers and local exchange companies when PA intrastate access charges are reduced from current levels to three different benchmarks. In Case I, where each RLEC establishes parity between its own interstate and intrastate rates, the net social welfare gain is equivalent to \$28 million, with long-distance providers and consumers gaining \$16.2 million and \$50 million respectively and local exchange providers losing \$38.2 million in access revenues. For Case II, all local exchange companies reduce their intrastate access charges to the national average interstate access charge. The net social welfare gain is approximately \$27 million (gains of \$16.2 million and \$49.9 million for long-distance providers and consumers, and an access revenue loss of \$38.1 million for local access providers). However, the distribution of these gains and losses show different patterns when disaggregated by RLEC. Since some RLECs (Windstream/D&E and Century Link/Embarq) currently have interstate access charges *below* the national average interstate access charge, consumers and long-distance providers would gain more under Case I (intrastate-interstate access charge parity) than under Case II (national average interstate access charge as benchmark) for these companies. But for the other two RLECs (Frontier and Consolidated/North Pitt), the gains and losses are reversed since these companies currently have higher interstate access charges than the national average. Case III calculated the gains and losses when the intrastate access charges for all companies are reduced to the level of Verizon’s intrastate access charges: long distance companies and consumers gain \$14.7 million and \$46.1 million, and local exchange companies lose \$34.9 million dollars, for a net social welfare gain of \$25.8 million.

Table 2.3: Estimation of net social welfare gain from reducing intrastate access charges to the LEC's current interstate rates (Case I) and to the national average interstate access charge (Case II)

	Access lines in PA [1] #	Co's intrastate access charge [1,3] cents	Co's interstate access charge [1,3] cents	Co's intrastate minutes of usage [1] mill. mins	Estimated intrastate toll revenue [2] \$ mill	Access charge to price ratio A/p
Century Link/Embarq	291186	4.76	1.20	400.82	36.11	0.528
Frontier	303220	5.92	2.44	505.33	45.53	0.657
Windstream/D&E	307411	3.70	1.42	520.10	46.86	0.411
Consol./North Pitt	11102	4.40	2.64	26.05	2.35	0.488
Total big-4 RLEC	912919	4.78	1.70	1452.30	130.85	0.531
Unaffiliated	111881	4.15	2.63	221.55	19.96	0.461
All non-Verizon	1024800	4.71	1.80	1673.85	150.81	0.523
Verizon	4216012	1.92	0.76	5343.14	481.42	0.213
Total PA	5240812	2.58	0.95	7017.00	632.23	0.286

	Case I: Parity to Company's Interstate access charge					Case II: Parity to national average interstate access charge					Case III: Parity to Verizon's intrastate access charge				
	$\Delta A/A$	$\Delta PS$	$\Delta CS$	$\Delta TP$	$\Delta SW$	$\Delta A/A$	$\Delta PS$	$\Delta CS$	$\Delta TP$	$\Delta SW$	$\Delta A/A$	$\Delta PS$	$\Delta CS$	$\Delta TP$	$\Delta SW$
	$\Delta A/A$	\$ mill	\$ mill	\$ mill	\$ mill	$\Delta A/A$	\$ mill	\$ mill	\$ mill	\$ mill	$\Delta A/A$	\$ mill	\$ mill	\$ mill	\$ mill
Century Link/Embarq	0.748	5.54	16.29	-12.71	<b>9.12</b>	0.641	4.44	13.65	-10.44	<b>7.64</b>	0.597	4.02	12.60	-9.57	<b>7.05</b>
Frontier	0.588	4.91	20.00	-13.71	<b>11.20</b>	0.711	6.60	25.04	-17.62	<b>14.02</b>	0.676	6.08	23.55	-16.44	<b>13.19</b>
Windstream/D&E	0.616	4.90	12.83	-10.55	<b>7.19</b>	0.538	4.14	11.08	-9.02	<b>6.20</b>	0.481	3.62	9.83	-7.95	<b>5.50</b>
Consol./North Pitt	0.400	0.16	0.49	-0.37	<b>0.27</b>	0.611	0.26	0.77	-0.60	<b>0.43</b>	0.564	0.24	0.70	-0.55	<b>0.39</b>
Total big-4 RLEC	<b>0.644</b>	<b>16.20</b>	<b>50.00</b>	<b>-38.21</b>	<b>28.00</b>	<b>0.643</b>	<b>16.16</b>	<b>49.88</b>	<b>-38.11</b>	<b>27.94</b>	<b>0.599</b>	<b>14.66</b>	<b>46.07</b>	<b>-34.93</b>	<b>25.80</b>
Unaffiliated	0.366	1.17	3.54	-2.73	<b>1.98</b>	0.588	2.08	5.89	-4.67	<b>3.30</b>	0.537	1.86	5.34	-4.21	<b>2.99</b>
All non-Verizon	0.617	17.55	54.06	-41.34	<b>30.27</b>	0.637	18.34	56.04	-42.99	<b>31.38</b>	0.593	16.62	51.67	-39.35	<b>28.93</b>
Verizon	0.604	30.40	64.38	-58.72	<b>36.05</b>	0.109	5.04	11.29	-10.01	<b>6.33</b>	0.000	0.00	0.00	0.00	<b>0.00</b>
Total PA	0.632	53.35	120.79	-106.50	<b>67.64</b>	0.337	26.40	62.79	-54.03	<b>35.16</b>	0.256	19.64	47.30	-40.45	<b>26.49</b>

ASSUMPTIONS: elasticity ( $\epsilon$ )= 0.56 (see Table 1 of this report); interstate average access charge = 1.71 c (Table 1.2, Trends in Telephone Service, August 2008, FCC); intrastate per-minute charge =9.01 c (Intrastate toll revenues from Table 9.2, divided by total intraLATA interstate minutes, both from Trends in Telephone Service, 2008, FCC). NOTES: [1] Data compiled from LEC filings with the PA PUC; [2] Estimated intrastate toll revenue is the product of the company's intrastate minutes of usage (MOU) and the average intrastate per minute charge (9.01 cents); [3] Intrastate and interstate access charges for Total big-4 RLECs and All non-Verizon LECs calculated as weighted average, using access lines as the weight

In these calculations, it was assumed that intrastate long-distance rates for each RLEC's customers would be lowered to the extent that each RLEC lowered its access charges. However, under current law and business practice, long-distance carriers are required to average rates and apply the same long-distance prices to all customers in the state. This would imply that the interexchange carriers reduced intrastate prices by a common amount  $\Delta p \neq \Delta A_i$ , where  $\Delta A_i$  stands for the reduction in each RLEC's access charges. This common amount  $\Delta p$  may be calculated; to do so, we begin with the assumption that the long-distance carrier would adopt a rate reduction that would secure for it exactly the same benefit as it might have secured had it moved prices down separately to match each RLEC's rates. To estimate  $\Delta PS$ , we note as before that the long-distance provider gains additional revenue on new usage minutes, less the access payments. But in addition, the long-distance provider also gains revenue on *all* usage (old and new) because of the difference between the access charge reduction and the price reduction. For each RLEC 'i':

$$\Delta PS_i = (p - A_i) \cdot \Delta Q_i + (\Delta A_i - \Delta p) \cdot (Q_i + \Delta Q_i)$$

The change in demand may be calculated as before, with the significant difference that the relevant price change is  $\Delta p$  and not  $\Delta A$ ; also, since the same price change is applied to all RLECs, the change in quantity demanded will be proportional to original demand.

$$\Delta Q_i = k \cdot Q_i \text{ where } k = \left(1 - \frac{\Delta p}{p}\right)^{-\varepsilon} - 1$$

Thus the total change in producer surplus for all RLECs may be calculated:

$$\sum \Delta PS_i = k \cdot \sum (p - A_i) \cdot Q_i - \Delta p \cdot (1 + k) \cdot \sum Q_i + (1 + k) \cdot \sum \Delta A_i \cdot Q_i$$

To find the uniform price change equivalent to the  $\Delta PS$  calculated in Table 3, we set the expression for aggregate producer surplus change shown above to the  $\Delta PS$  calculated for each case. Thus, for Case I, we set  $\sum \Delta PS_i = \$16.2$  million, for Case II, \$16.16 million and for Case III, \$14.66 million. The solution to this is difficult to calculate directly due to the presence of the exponential terms in  $k$ , but an approximate solution can be found using numerical methods. For case I, this works out to a uniform intrastate long-distance price reduction of 3.02 cents; since the producer surplus is almost identical in Case II, the intrastate price reduction is also 3.02 cents; in Case III, where the producer surplus to be realized is smaller, the price reduction passed on to consumers will be greater: in this case, the price reduction is 3.16 cents. Note that this price reduction is lower than the access charge reduction for some RLECs, and higher for others.

The change in consumer surplus and transfer payments (access revenue) can also be calculated with the uniform long-distance prices. The aggregate change over all RLECs can be calculated as  $\sum CS_i$  and  $\sum TP_i$ . For  $\Delta CS$ , we substitute  $\Delta p$  for  $\Delta A$  in the equation. Thus:

$$\Delta CS_i = \frac{pQ_i}{1 - \varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{\Delta p}{p} \right]^{1 - \varepsilon} \right\}$$

$$\sum CS_i = \frac{p}{1-\varepsilon} \cdot \left\{ 1 - \left[ 1 - \frac{\Delta p}{p} \right]^{1-\varepsilon} \right\} \cdot \sum Q_i$$

But for  $\Delta TP$ , the loss of access revenue on existing demand is the same as before; the per unit gain on new demand is also the same except that the change in quantity demanded is different since the price change is not  $\Delta A$ , but the uniform  $\Delta p$ .

$$\Delta TP_i = \Delta Q_i(A_i - \Delta A_i) - Q_i \cdot \Delta A_i, \text{ where } \Delta Q_i = \left[ \left( 1 - \frac{\Delta p}{p} \right)^{-\varepsilon} - 1 \right] \cdot Q_i$$

$$\sum TP_i = \sum \{ \Delta Q_i(A_i - \Delta A_i) - Q_i \cdot \Delta A_i \}$$

The results are reported in Table 2.4, for the three cases.

	Case I: Parity with RLEC's own interstate rates		Case II: Parity with national average interstate rate		Case III: Parity with Verizon's intrastate rate	
	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)
$\Delta PS$	16.20	16.20	16.16	16.16	14.66	14.66
$\Delta CS$	50.00	48.87	49.88	48.90	46.07	51.52
$\Delta TP$	-38.21	-37.70	-38.11	-37.69	-34.93	-37.27
$\Delta SW$	27.99	27.37	27.93	27.36	25.80	28.91

Table 2.4: Net change in social welfare, with and without geographically averaged intrastate long-distance prices

Notice that there is no change in interexchange carrier profits under the three assumptions because the price reductions under uniform prices were calculated setting the profits equal under all three cases. There are minor changes in the other sub-components.

## 2.7 Estimation of impact on Subscriber Line Charges (SLC)

Under Act 183 passed by the Pennsylvania legislature in August 2004, any change in access charges has to be revenue neutral for local exchange companies. In practice, this has implied that any reduction in access revenues has to be compensated for with an increase in the subscriber line charges (SLCs) billed directly to consumers. This has been a matter of some concern to consumers and advocacy groups because large increases in directly billed expenditures will have a negative impact on telephone penetration and universal service, the burden falling more heavily on low-income users.

With the estimation results provided above, it is possible to calculate the average change in subscriber line charges if *all* access revenue reductions were passed on to consumers in the form of a higher SLC. For example under Case I (parity between company's interstate and intrastate rates), and with geographically averaged intrastate long-distance prices, the total change in access revenues is a loss of \$37.70 million. The total number of access lines for the four RLECs combined is 0.91 million—however, a subscription price increase might reduce the number of access lines, with the result that the RLECs will have to make up their access revenue loss from a smaller base of subscribers. Thus, if  $Q_s$  and  $p_s$  are the number of subscribers and the subscription price, and  $\Delta Q_s$  and  $\Delta p_s$  the changes in these quantities,

$$(Q_s - \Delta Q_s) \cdot \Delta p_s = \$37.70 \text{ mill.}$$

Assuming a constant elasticity function for subscriptions as well, we have:

$$\Delta Q_s = \left\{ 1 - \left[ \frac{p_s + \Delta p_s}{p_s} \right]^{-\varepsilon_s} \right\} \cdot Q_s$$

Note that  $\Delta Q_s$  is a negative quantity due to the price increase. The value of  $\Delta p_s$  can be worked out using numerical methods, provided the price elasticity of demand for subscriptions  $\varepsilon_s$  is known. The consensus in the literature is that subscription demand is quite inelastic: for example, Ackerberg et al. (2008) found a price elasticity of -0.035.<sup>117</sup> Garbacz and Thompson have estimated a price elasticity of -0.0078, not statistically different from zero.<sup>118</sup> They more recently found that own-price elasticity for subscription demand has fallen over time, from the 1970s to the present level of -0.006 to -0.011. Garbacz and Thompson explain this by pointing out that real household incomes rose over this period, even as telephone service added new capabilities making a subscription much more valuable to the consumer. In other words, these studies argue that subscription price increases are likely to have virtually no impact on penetration rates. However, Ward and Woroch have questioned these low estimates, stating that they do not account for the substitution effect between landline and other technologies offering voice communication capabilities, such as mobile, VOIP and cable telephony. Their own estimates for own- price elasticity are higher, between -0.23 to -0.26 for fixed service.<sup>119</sup> Given the range of these results, we assume a price elasticity of 0.1 for subscriptions in these calculations.

Currently, the Pennsylvania PUC has set a limit of \$18 for basic telephone subscriptions. Using this as the initial price ( $p_s$ ), a price elasticity of 0.1 and the combined total number of access lines for the four RLECs ( $Q_s$ , 0.91 million lines), we calculate for Case I that the average annual increase in SLC would be \$42.12 or a monthly increase of \$3.51, to fully compensate the RLECs

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<sup>117</sup> Ackerberg, D., Riordan, M., Rosston, G., Wimmer, B., 2009. Low-income demand for local telephone service: The effects of Lifeline and Linkup. SIEPR Policy paper No. 08-047. Accessed July 30, 2010, at <http://siepr.stanford.edu/publicationsprofile/2013>

<sup>118</sup> Garbacz, C., Thompson, H., 1997. Assessing the impact of FCC Lifeline and Linkup programs on telephone penetration. *Journal of Regulatory Economics*, 11, pp. 67-78.

<sup>119</sup> Ward, Michael, and Woroch, Glenn (2010, forthcoming). The effect of prices on fixed and mobile telephone penetration using price subsidies as natural experiments. *Information Economics and Policy*, 22(1). An early version is available at [http://businessinnovation.berkeley.edu/Mobile\\_Impact/Ward\\_Woroch\\_Fixed\\_Mobile\\_Penetration.pdf](http://businessinnovation.berkeley.edu/Mobile_Impact/Ward_Woroch_Fixed_Mobile_Penetration.pdf)

for any access revenue losses. For Case II and Case III, a similar calculation shows that the monthly increases would be \$3.51 and \$3.47 respectively. Even if all access revenue reductions are made good from consumer surplus through an increased SLC, consumers in general stand to benefit: as shown in Tables 3 and 4, the value of  $\Delta CS - \Delta TP$  is positive under all three scenarios.

An increase in subscriber line charges will have an impact on both consumers and LECs and will need to be factored into the calculations of net social welfare. The effect is negative effect on consumer surplus. At the margin, some consumers may decide to unsubscribe due to the subscription price increase; those consumers that remain will also enjoy lower consumer surplus due to the increase in subscriber line charges. The LECs get to recover their access revenue losses from higher SLCs on the subscribers that remain; but they also realize cost savings from not serving consumers who unsubscribe. Again, the magnitude of these effects will depend on the price elasticity of demand in the subscription market. Figure 2.6 clarifies these effects.

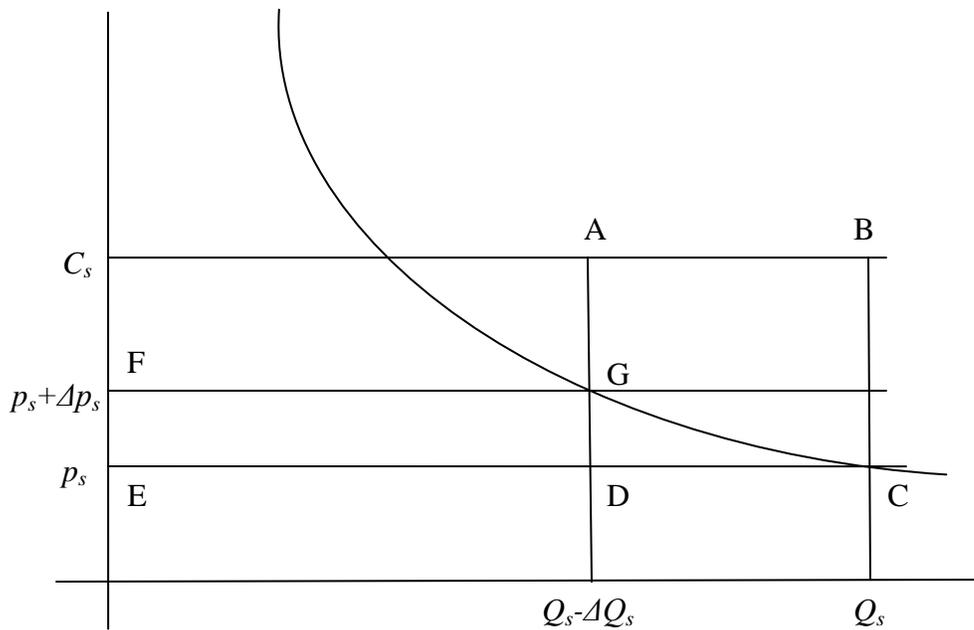


Figure 2.6: Effect of increased SLC on consumers and local exchange providers

In Figure 2.6, an increase in subscription price from  $p_s$  to  $p_s + \Delta p_s$  results in a reduction of demand from  $Q_s$  to  $Q_s - \Delta Q_s$ . The loss of consumer surplus is denoted by the shape CEFG bounded by the two price lines and the demand curve.

$$\Delta CS = \frac{p_s Q_s}{1 - \varepsilon_s} \cdot \left\{ 1 - \left( 1 + \frac{\Delta p_s}{p_s} \right)^{1 - \varepsilon_s} \right\}$$

At the same time, the RLECs are compensated for lost access revenue from the additional SLC revenue denoted by  $(Q_s - \Delta Q_s) \cdot \Delta p_s$ , the shape EFGD. However, they also realize cost savings due to the lower subscriber count ( $-\Delta Q_s$ ). In the figure, the cost of providing subscription services are shown above the prices charged because the rationale for the access charge regime is

to allocate part of the local loop costs to long-distance service. The total costs of the local loop are thus supported by direct subscriber payments and interstate and intrastate access revenues. In the figure, this is represented by the shape ABCD. The net gain to RLECs will thus be equal to:

$$\Delta PS = (C_s - p_s) \cdot \Delta Q_s = (C_s - p_s) \cdot Q_s \cdot \left\{ 1 - \left[ \frac{p_s + \Delta p_s}{p_s} \right]^{-\epsilon_s} \right\}$$

While we have data on most parameters in the above equation, a definite number for local loop costs is not available. A reasonable estimate may be made by assuming that each company's local loop costs are fully supported by its direct subscriber payments and interstate and intrastate access revenues. Table 2.5 presents the calculations.

	Co's Access lines in PA [1] #	Co's intrastate access charge [1,2] cents	Co's intrastate minutes of usage [1] mill. mins	Co's interstate access charge [1,2] cents	Co's interstate minutes of usage [1] mill. mins	Co's estimated local loop costs [3] \$ mill	Co's per line cost [4] \$
Century Link/Embarq	291186	4.76	400.82	1.20	759.92	33.44	114.84
Frontier	303220	5.92	505.33	2.44	598.08	49.97	164.79
Windstream/D&E	307411	3.70	520.10	1.42	621.40	33.60	109.30
Consol./North Pitt	11102	4.40	26.05	2.64	35.34	2.28	205.28
<b>Total big-4 RLEC</b>	<b>912919</b>	<b>4.78</b>	<b>1452.30</b>	<b>1.70</b>	<b>2014.74</b>	<b>120.23</b>	<b>131.70</b>
Unaffiliated	111881	4.15	221.55	2.63	334.61	20.01	178.84
All non-Verizon	1024800	4.71	1673.85	1.80	2349.35	139.76	136.38
Verizon	4216012	1.92	5343.14	0.76	10334.80	257.02	60.96
Total PA	5240812	2.58	7017.00	0.95	12684.15	395.87	75.54

NOTES: [1] Compiled from LEC filings with the PA PUC; [2] Intrastate and interstate access charges for Total Big-4 RLECs and all non-Verizon are weighted averages using number of lines as weight; [3] Estimated local loop cost = intrastate access charge x intrastate MOU + interstate access charge x interstate MOU + no. of lines x annual SLC; [4] Per line cost = company's local loop cost / no. of lines

Table 2.5 Estimation of Local Loop Costs

As shown in Table 2.5, an estimate of local loop cost is around \$132 for the big-4 RLECs. With this input, we can now recalculate the net change in social welfare in Table 2.4, including the effect of the change in subscriber line charges.

	Case I: Parity with RLEC's own interstate rates			Case II: Parity with national average interstate rate			Case III: Parity with Verizon's intrastate rate		
	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)	with uniform prices and higher SLC (\$mill)	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)	with uniform prices and higher SLC (\$mill)	without uniform prices (\$ mill.)	with uniform prices (\$ mill.)	with uniform prices and higher SLC (\$mill)
<i>ΔPS</i>	16.2	16.2	16.2	16.2	16.2	16.2	14.7	14.7	14.7
<i>ΔCS</i>	50.0	48.9	10.9	49.9	48.9	10.9	46.1	51.5	14.0
<i>ΔTP</i>	-38.2	-37.7	1.8	-38.1	-37.7	1.8	-34.9	-37.3	1.8
<i>ΔSW</i>	28.0	27.4	28.9	27.9	27.4	28.9	25.8	28.9	30.5

Table 2.6 Estimating the impact of increases in SLC on social welfare

The economic modeling in this section demonstrated that overall social welfare from intercarrier compensation reform, including gains to interexchange carriers, consumers and local exchange companies is strongly positive, approximately \$26-28 million in the three cases we considered. The net change in social welfare is highest for Case 3, parity with Verizon's intrastate rate. It may however be administratively simple to require parity between the RLEC's own inter- and intrastate rates. In the next section, we turn to an examination of the interconnection and access regimes in a few leading countries around the world.

### 3. INTERNATIONAL COMPARATIVE REVIEW OF ACCESS REGIMES

#### 3.1 General Introduction

In reforming the U.S. intercarrier compensation regime, much can be learned from the experiences of other countries and national groupings, such as the United Kingdom, Japan, Israel South Korea and the European Union. Obvious differences exist between the U.S. and these foreign entities: while the United States is a national unit with a history as a political and economic unit for more than 200 years, the European Union is a loose federation of 27 independent nation-states, relatively newly established and in a constant state of flux, with regards to organizational form and membership. While the United States occupies a continent-size landmass, the nation states mentioned above are far smaller and their population is far less rural and dispersed. Despite these differences, much can be learned from the European, British, Israeli, Japanese and Korean approaches to be imitated in the US, if indeed the goal of United States telecommunications policy is as delineated in the Communications Act of 1934 to promote through competition the universal non-discriminating availability of a "wire and radio communication service with adequate facilities at reasonable charges."<sup>120</sup>

In this section, we will discuss major reform initiatives in intercarrier compensation implemented

<sup>120</sup> Communications Act, 1934 SEC. 1. [47 U.S.C. 151] PURPOSES OF ACT

abroad, with a focus on their relevancy and applicability to the U.S. case.

### 3.2 European Union

The first cross-European liberalization policy was only introduced in 1988, but by 1990, the Union identified the connection between growth in the information sector and economic competitiveness on a global scale and linked it to liberalization policies. By 1993, it set a 1998 deadline for full liberalization of voice telephony, allowing member states and incumbent PTTs a lengthy period of adjustment.<sup>121</sup> The initial European regulatory framework was reconsidered within two years in a review<sup>122</sup> that instigated the drafting of the New Regulatory Framework (NRF), which became law in 2003.<sup>123</sup> The entire regulatory framework was to be accepted by member states by July 2003 and while the focus of liberalization had been voice telephony in 1998, by 2003 the policy was aimed at enhancing Internet access.

The asymmetry of termination rates among incumbents, competitors and mobile operators across Europe had been a cause for concern all along the liberalization process and became specifically pronounced following the adoption of the NRF. All National Regulatory Agencies (NRA) conducted market analyses that signaled the need for *ex ante* regulation, and determined that in both mobile and fixed termination markets operators had significant market power,<sup>124</sup> what has been coined as a “terminating monopoly.”<sup>125</sup> As a result, nearly all NRAs imposed some form of *ex ante* regulation on call termination markets, including in the form of price controls.

The ERG’s “Common Position” on call termination states that the ideal situation would call for eliminating all existing asymmetry in call termination relationships among carriers. The only situation that the ERG deems as justifying any form of asymmetry among carriers is one that favors new entrants, and in no situation is it one that favors the entrenched incumbents who hold on to the terminating monopoly. Even in those situations, termination rates should be brought

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<sup>121</sup> Waverman, Leonard and Sirel, Esen (1997) ‘European Telecommunications Markets on the Verge of Full Liberalization’, *Journal of Economic Perspectives* 11(4): 113–26.

<sup>122</sup> See 1999 Communications Review; at: [europa.eu.int/ISPO/infosoc/telecompolicy/review99/com2000-239en.pdf](http://europa.eu.int/ISPO/infosoc/telecompolicy/review99/com2000-239en.pdf) (accessed 21 August 2006).

<sup>123</sup> For a general introduction of the 2003 regulatory framework see: [europa.eu.int/information\\_society/topics/telecoms/regulatory/new\\_rf/text\\_en.htm#Introduction](http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/text_en.htm#Introduction) (accessed 21 August 2006). The five individual directives that comprise the new framework were: Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a Common Regulatory Framework for Electronic Communications Networks and Services, Official Journal L 108/33, 24 April 2002 (aka ‘the ‘Framework Directive’); Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on Access to, and Interconnection of, Electronic Communications Networks and Associated Facilities, Official Journal L 108/7, 24 April 2002 (‘Access Directive’); Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the Authorization of Electronic Communications Networks and Services, Official Journal L 108/21 (‘Authorization Directive’); Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on Universal Service and Users’ Rights Relating to Electronic Communications Networks and Services, Official Journal L 108/51, 24 April 2002 (‘Universal Service Directive’); Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 Concerning the Processing of Personal Data and the Protection of Privacy in the Electronic Communications Sector (‘Data Privacy Directive’).

<sup>124</sup> ERG (07) 83 final 080312

<sup>125</sup> J. Scott Marcus (2004) Call Termination Fees: The U.S. in global perspective [ftp://ftp.zew.de/pub/zew-docs/div/IKT04/Paper\\_Marcus\\_Parallel\\_Session.pdf](ftp://ftp.zew.de/pub/zew-docs/div/IKT04/Paper_Marcus_Parallel_Session.pdf)

down to the “cost of an efficient operator” as soon as possible.

Among competing economic arguments, the ERG adopts the position that the “costs incurred by a hypothetical efficient operator” should determine termination rates. It claims this position leads to more efficient operators and contributes to end users’ welfare. Adopting a model that allows recovering the inefficiencies of each individual operator (as opposed to those of the ideal one) ends up with efficient operators subsidizing the non-efficient ones. The two instances in which asymmetry among operators may be justified, according to this analysis are when spectrum allocations are unequal (in the case of mobile termination) and in order to encourage new entrants to the market. Clearly asymmetric termination rates are not justified in order to protect incumbent operators.

The ERG report was a major determinant of the adoption, on May 7 2009, of the European Commission’s recommendations on the “Regulatory Treatment of Fixed and Mobile Termination Rates in the European Union.”<sup>126</sup> The Commission noted that “a divergence between price control measures prevails across Member States” and that there is “a significant variety in the chosen costing tools” as well as “different practices implementing these tools.”<sup>127</sup> Indeed, some explanatory power to this asymmetry can be explained by national specificities, such as the rulings of some National Regulatory Agencies authorizing higher termination rates for smaller fixed and mobile operators as a result of recognizing the fact that they are new entrants and as a result did not enjoy the economies of scale the incumbents did. Other specificities include differing cost conditions, which may be national or regional.

Still, the commission adopts a clear position: “When imposing price control and cost-accounting obligations ... on the operators designated by National Regulatory Authorities (NRAs) as having significant market power on the markets for wholesale voice call termination on individual public telephone networks ... NRAs should set termination rates based on the costs incurred by an efficient operator. This implies that they would also be symmetric.”<sup>128</sup> The relevant cost methodology to evaluate efficient costs should be long-run incremental costs (LRIC) and based on efficient technologies, Next Generation Networks for fixed and digital networks for mobile.

### 3.3 The United Kingdom

A good illustration of the way in which the European Union’s regulatory framework is applied at the member state level is the manner in which OFCOM, the British regulator, has acted. OFCOM chose to define markets very narrowly, thus for out going international calls it defined the market for each country as a separate market, since calls to one country cannot substitute calls to another.<sup>129</sup> At the same time, with regards to call termination, OFCOM considers every network, be it fixed or mobile, to be a separate market, since yet again, a caller cannot choose to bypass the terminating network when interested in reaching a particular individual<sup>130</sup> or in the words of

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<sup>126</sup> Decision 2009/396/EC, OJ L 124, 7.5.2009, p. 67

<sup>127</sup> Ibid

<sup>128</sup> Id., at 70

<sup>129</sup> Ian Walden (Ed.) 2009. *Telecommunications Law and Regulation*. Oxford and New York: Oxford University Press.

<sup>130</sup> Director General of Telecommunications, *Review of fixed geographic call termination market* (2003).

the Director General of Telecommunications<sup>131</sup>: “The terminating provider has a monopoly in the provision of fixed geographic termination and this is the case irrespective of who wishes to buy call termination.”<sup>132</sup>

In a system in which the calling party pays, explains the British regulator “the call termination charge will be included in the originating network provider’s cost base and is likely to be reflected in the retail price it sets for calls. It therefore follows that increases in the price of wholesale fixed geographic call termination may lead to higher retail call prices. Increases in call termination prices are of less consequence to the called party, as the called party does not bear them, and it is therefore unlikely that a customer would decide to connect to a network on the basis of that network’s call termination charge.”<sup>133</sup>

As a result concludes the Director of Telecommunications “... terminating providers naturally have an incentive to raise the charge for termination to maximise their call termination profitability” and he coins this form of market failure the “termination externality.”<sup>134</sup> His conclusion is that “fixed geographic call termination on each network constitutes a separate market.”<sup>135</sup>

The result of this determination was that each operator’s prices for incoming calls were regulated relative to the level of control they had in the outgoing call market, the logic being that the more an operator controls in the outgoing market, the more leverage it has in negotiating better prices for itself for termination. At the end of the day, when applying the regulations to actual disputes, and as demonstrated in the 2004 dispute between British Telecom and Telewest, charges for call termination on fixed networks are calculated on the basis of “reciprocal charging,” which in practice means they are identical for all parties involved.<sup>136</sup>

### 3.4 Israel

With the advent of the information revolution, following the dictates of the World Trade Organization, and in line with public demand, the Ministries of Communications (MOC), Justice and the Treasury, which jointly develop government policy, initiated a major overhaul of telecommunications law. The new Communications (Telecommunications and Broadcasting) law passed in 2001 set the stage for the entry of cable companies as well as new players to telephony and Internet markets.

A unique three-tiered system of licensing developed: The first tier included licensees awarded “general licenses.” Those are licenses for the provision of a variety of services over a specific

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<sup>131</sup> The name of the regulator prior to the formation of OFCOM.

<sup>132</sup> Supra note 130 at 16.

<sup>133</sup> Ibid

<sup>134</sup> Ibid

<sup>135</sup> Id. At 18

<sup>136</sup> Walden, supra note 129 at 430.

technology, but may exclude certain services.<sup>137</sup> The first “general license” was awarded to the national telecommunications carrier, Bezeq for the provision of telecommunications services<sup>138</sup> except for international or mobile phone services. In 2003 a second general license for “fixed in-country telecommunications services,” which included the same limitations, was awarded to the unified cable company Hot Telecom.<sup>139</sup> The “fixed in-country telecommunications services” general license was indeed limited to those services, in other words having a “fixed in-country telecommunication service” license meant a prohibition on providing either mobile or international service. Since 1994 four “general licenses” for mobile services and four “general licenses” for international phone service were awarded as well.<sup>140</sup> What characterizes all “general licenses” is that they all contain universal access and interconnection obligations.<sup>141</sup>

The second-tier of licenses are the “special licenses.” These are defined as licenses for a specific service, and over the years 15 different types of licenses emerged, mostly crafted to fit emerging telecommunications services offered by emerging upstarts in a burgeoning and innovative telecommunications market. These licenses included such services as Internet access; Internet switching; wireless services; satellite services; transmission services; and many more.<sup>142</sup> Holders of special licenses do not have any universal service obligations nor are they obliged to interconnect; however, Bezeq, as the monopoly inland telecom provider, is obliged to interconnect to any “special license” holder upon request.<sup>143</sup>

The third-tier of licenses, the “specialized general licenses,” is a hybrid between the “general” and “special” licenses. Caught between Bezeq’s refusal to unbundle the local loop (and the Knesset’s refusal to enforce it) and between the desire to at least create an aura of competition in inland services, the Communications (Telecommunications and Broadcasting) Law was amended to allow the awarding of a “general license” (which meant the license to provide a wide range of services) that did not contain within it an obligation for the provision of universal service. Between 2005 and 2009, the Ministry awarded five such licenses; all of them for the provision of “fixed in-country telecommunications services.”<sup>144</sup> By not requiring universal provision of the service, there was no need to enforce the incumbent, Bezeq, to share its network with competitors; however, the result was, of course, that competition would be introduced only in traffic-heavy markets, in particular in heavily populated areas and for business customers.

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<sup>137</sup> However, as the Supreme Court determined in the past, they do not provide unlimited powers to the licensees, even though they are defined as “general.” H CJ 1255/94 Bezeq, the Israeli Communications Corporation v. The Minister of Communications, 49(3) PD 661

<sup>138</sup> [http://www.moc.gov.il/sip\\_storage/FILES/2/622.pdf](http://www.moc.gov.il/sip_storage/FILES/2/622.pdf)

<sup>139</sup> [http://www.moc.gov.il/sip\\_storage/FILES/3/623.pdf](http://www.moc.gov.il/sip_storage/FILES/3/623.pdf)

<sup>140</sup> For a complete list of “general licenses” see: <http://www.moc.gov.il/191-he/MOC.aspx>. In fact, more than four international licenses were awarded, but there has been some merger activity which has lowered the current number to four.

<sup>141</sup> Another limitation set on the “fixed in-country telecommunications services” operators was the prohibition to provide bit stream access. Thus, consumers wishing to have a broadband connection had to sign up with two service providers: a “fixed in-country telecommunications services” to provide the modem and an Internet Service Provider (with a special license) to provide the bit stream.

<sup>142</sup> For a complete list of the “special licenses” types see: <http://www.moc.gov.il/192-he/MOC.aspx>

<sup>143</sup> See article 23 to Bezeq’s General License supra note 138

<sup>144</sup> The list of “specialized general” licensees can be found at <http://www.moc.gov.il/191-he/MOC.aspx>

Indeed, the market emerged as envisioned: a national duopoly of wireline telephone providers,<sup>145</sup> and as expected, issues of interconnection and access charges were at the center of regulatory interventions. These took place at three levels: Mobile termination; incumbent wireline-competitive wireline interconnection; and wireline – Voice over Broadband interconnection.

### 3.4.1 Fixed to Mobile and Mobile to Mobile Termination

In 2000, following the introduction of the third mobile operator in Israel,<sup>146</sup> the Ministry of Communications decided to regulate termination over mobile networks.<sup>147</sup> The regulatory intervention followed a crucial legislative amendment. Indeed, while the original Telecommunications Law of 1982 stated that the regulator<sup>148</sup> can determine the price of any “utilization of a license holder’s telecommunications facility” based on the “total cost of the utilization with the addition of a reasonable profit,”<sup>149</sup> the 2000 amendment to the law enacted in order to initiate competition in the market rephrased the bounds within which the regulator operates and stated that the price of interconnection will be determined by the regulator as based on the “cost of the interconnection, according to a *method of calculation* the Minister will indicate.”<sup>150</sup> The Ministry was convinced that the different wording allowed it to introduce accounting methods such as LRIC in order to determine the regulated termination price. In 2000 the Ministry made its first move to regulate mobile and wireline termination according to this scheme. While the process was not free of pressures and political compromises, over the past decade mobile termination rates have dropped by 30 percent.

### 3.4.2 Incumbent wireline-competitive wireline interconnection

The entry of Hot Telecom, the cable company, into the market required reference to call termination charges between landline operators. The first step in this direction was the elimination of long distance charges. In 2002, the price of long distance and local inland calls among Bezeq subscribers was equalized<sup>151</sup> even though according to calculations made by the committee appointed to regulate Bezeq’s tariffs in 1998 (“the first Grunau committee”) the direct cost of a long distance call was double that of a local call.<sup>152</sup> This step was taken in order to provide Bezeq with the ability to compete with both mobile providers and future providers of

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<sup>145</sup> The cable company, of course, provided also multichannel television while the incumbent Bezeq was allowed to hold a commanding share in the Direct Broadcast Satellite operator.

<sup>146</sup> For a history of mobile telephony in Israel see: Cohen, Akiba, Lemish, Dafna & Schejter, Amit (2008) *The wonderphone in the land of miracles*. Cresskill, NJ: Hampton Press

<sup>147</sup> For the history of mobile termination in Israel see:

[http://www.moc.gov.il/new/documents/about/yizhar\\_10.2.05.pdf](http://www.moc.gov.il/new/documents/about/yizhar_10.2.05.pdf)

<sup>148</sup> Which is the Minister of Communications

<sup>149</sup> The text of the original Telecommunications Law can be found at:

[http://www.knesset.gov.il/review/data/heb/law/kns10\\_telecommunications.pdf](http://www.knesset.gov.il/review/data/heb/law/kns10_telecommunications.pdf)

<sup>150</sup> The current version of the Communications (Telecommunications and Broadcasting) Law can be found at <http://www.moc.gov.il/new/documents/legislation/b-82.pdf>

<sup>151</sup> Report of the committee for the regulation of Bezeq tariffs, the “second Grunau committee”) at 27. Can be accessed at [http://www.moc.gov.il/sip\\_storage/FILES/5/555.pdf](http://www.moc.gov.il/sip_storage/FILES/5/555.pdf)

<sup>152</sup> The “first Grunau committee report” is available at [http://www.moc.gov.il/sip\\_storage/FILES/8/578.pdf](http://www.moc.gov.il/sip_storage/FILES/8/578.pdf)

“in-country wireline telecommunications services” that were looming over the horizon. The next step addressed the needs of the competitors: In an administrative ruling made in 2004, the Ministry of Communications enforced a “Bill & Keep” policy for the first two years of operation of a competitive “general license” holder, a move that gained the approval of the Supreme Court, following a challenge launched by Bezeq.<sup>153</sup> In 2006 the Ministry extended the “Bill & Keep” decree for an additional 9 months.<sup>154</sup> By the time the “Bill & Keep” policy expired, wireline termination fees were lowered to the equivalent of US\$ 0.01 at peak times and approximately 60% of that tariff for off-peak times. By May of 2009, the total market share of all wireline competitors combined in the private sector was around 22% of the market (in normative income figures) and 18% in the business sector.<sup>155</sup>

### 3.4.3 Wireline – Voice over Broadband Interconnection

A third relationship the Ministry felt obliged to regulate was a result of the emerging market of Voice over IP providers, a service that in Israel was named “Voice over Broadband” or “VoB.” In 2004 the Ministry designated VoB services as licensable, and thus outlawed their provision without a license, committing to start the issuing of licenses in mid 2005.<sup>156</sup> The main concern at the time was the loss of income from call termination by wireline operators and the potential introduction of VoB services by Bezeq, two developments which may lead to the eventual disintegration of what seemed to be a carefully regulated market in which competitors were struggling to take hold and the Bezeq monopoly was only at the margins giving up total control of the market. The Ministry concluded that the licenses should be “specialized general licenses” and continued the public hearing for two more years. By 2007, following the prolonged public consultation, the Ministry published its long awaited policy on the issue.<sup>157</sup> It reiterated that VoB services will be provided under a “specialized general license” with all that such a designation entails, including access to emergency services and provision of services to the security forces and that Bezeq and its subsidiaries will not be allowed to provide the service until its market share falls under 85%, so that it will not serve to bypass the regulation of Bezeq tariffs.<sup>158</sup> The rules maintained that VoB providers will be eligible to receive from other interconnecting operators the same tariff that a full licensed “in-country wireline telecommunications services” provider is entitled to, even though it is clear that the cost to terminate a call on a VoB network is lower than the parallel cost on a circuit switched network. In other words, the same way that the cable competitor received a “fledgling industry” status by not being required to pay termination fees to Bezeq, allowing it to charge a high incoming termination fee protected the fledgling VoB industry. This policy was justified by the relatively long tradition of supporting fledgling industries in the Israeli system, which was also supported in this case by the antitrust authorities and the treasury.<sup>159</sup> This policy was to be intact for two years after which it was to be revisited, however that reconsideration procedure is yet to be launched.

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<sup>153</sup> <http://www.moc.gov.il/256-899-he/MOC.aspx>

<sup>154</sup> <http://www.moc.gov.il/238-772-he/MOC.aspx>

<sup>155</sup> Report of the Ministry of Communications to network operators, on file with authors.

<sup>156</sup> [http://www.moc.gov.il/sip\\_storage/FILES/1/531.pdf](http://www.moc.gov.il/sip_storage/FILES/1/531.pdf)

<sup>157</sup> [http://www.moc.gov.il/sip\\_storage/FILES/9/529.pdf](http://www.moc.gov.il/sip_storage/FILES/9/529.pdf)

<sup>158</sup> The rationale for the VoB policy is outlined in an accompanying letter furnished to all operators and on file with authors.

<sup>159</sup> Ibid

### 3.5 South Korea

Prior to exposing the Korean telecommunication services market to internal competition in the 1990s, the government-owned Korea Telecom (KT) and the Korea Mobile Telecom monopolized both Korea's fixed line telephony market and mobile services market.<sup>160</sup> As a result of a series of government efforts to restructure the telecommunication market, the international long distance services market, domestic long distance services market, and local phone service market were liberalized in 1990, 1995 and 1997, respectively.<sup>161</sup> In addition, the mobile services market was liberalized through the licensing of new entrants in 1994. This ongoing effort restructure the Korean telecommunication market culminated in 1997 by ending the local phone service monopoly.<sup>162</sup>

Along with the liberalization of each telecommunication service sector, the government-owned Korea Telecom was gradually privatized, a process which ended in 2002. Changes in the Korean regulatory environment were also directed at government reform, as the newly created Ministry of Information and Communication (MIC) upended the Ministry of Communications. The interconnection regime was established in 1994 under the newly passed Telecommunications Business Act.<sup>163</sup> The Telecommunications Business Act classified telecommunication services into three categories: facility-based services (operators owning facilities and providing facility-based services); special services (operating not owning facilities, but providing the equivalent of facility-based services) and value-added services (operators not owning facilities, and providing only value-added services).<sup>164</sup>

#### 3.5.1 Termination rate decision procedure

The MIC required that all facilities-based service providers should conclude an interconnection agreement on request within 90 days from the request of any other telecommunication provider.<sup>165</sup> In case that an interconnection agreement is not reached within the specified period, the Korean Communications Commission (KCC), a subcommittee within the Ministry, was charged with the authority to intervene in order to resolve the conflict between the parties. This procedure was to be initiated by the request of either one of the interconnecting parties.<sup>166</sup> While MIC set the basic criteria on interconnection charges, KCC undertook the specific conflict resolution with arbitration.<sup>167</sup> In 2008, following political changes in Korea's government, the Korea Communications Commission was reorganized to take over the responsibilities of the

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<sup>160</sup> OECD (2002) Competition and Regulation Issues in Telecommunication, DAFFE/COMP(2002)6: 224

<sup>161</sup> *Id.*, at 224-226

<sup>162</sup> Byung-il Choi, "Telecommunications Regulation in Korea: Evolution and Current Status," *Korean Journal of International and Comparative Law* 26 (1998): 243-276

<sup>163</sup> Byoung Nam Lee, "Interconnection Models and Practices" ITU Regional Seminar on Costs and Tariffs for Member Countries of the Regional Group for Asia and Oceania (SG3RG-AO) Presentation (2009)

<sup>164</sup> OECD (2002) Competition and Regulation Issues in Telecommunications DAFFE/COMP(2002)6: 223-224

<sup>165</sup> OECD (2000) Regulatory Reform in Korea in Telecommunications Industry: 20

<sup>166</sup> *Ibid.*

<sup>167</sup> *Ibid.*

Ministry of Information and Communication, which was abolished.

Leading to 2004, the Ministry of Information and Communications adopted the Fully Distributed Cost methodology (FDC) to determine interconnection rates.<sup>168</sup> In 2004, this regime was replaced by the Long Run Incremental Cost methodology (LRIC), which was regarded as more efficient and market oriented. Under the FDC, interconnection rates tended to be overestimated, as the distribution of common costs across different services was insufficient. LRIC, which is based on future expected costs, takes into account hypothetical technological changes, and is applied to interconnection of local, long distance and mobile services was perceived to better reflect actual costs of the operators.<sup>169</sup> In practice, however, the interconnection pricing framework since 2004 uses Long-Run Average Incremental Cost (LRAIC) as the appropriate cost basis for pricing.<sup>170</sup> The LRAIC, as well, takes into account the future expected costs and technological change.

Fixed and mobile termination (interconnection) rates are reviewed by the KCC biannually on the basis of LRAIC methodology.<sup>171</sup> For example, the interconnection rates for 2006 – 2007 have been determined based on 2004 LRAIC that applied a Top-Down model for interconnection rates and a Bottom-Up model for average change rate in assessing termination rates. The fixed line termination rates per minute in Korea in 2006-2007 ranged from US\$ 0.0178 to US\$ 0.0203.<sup>172</sup>

### 3.6 Japan

Japan had traditionally separated the provision of in-country fixed services from international services. Until 1985, Nippon Telegraph and Telephone Public Corporation (NTT), a state-owned corporation had the monopoly over domestic telecommunications, and Kokusai Denshin Denwa (KDD), a government-regulated corporation, held the monopoly for international telecommunications services.<sup>173</sup> Japan introduced liberalization measures to both the long distance and local call markets in 1985.<sup>174</sup>

The 1985 Telecommunications Business Law (TBL) and NTT Law, which initiated NTT's privatization, set the tone for the liberalization of the telecommunication industry. The Telecommunications Business Law made a clear distinction between market participants who own infrastructure and those whose activities are based on leased infrastructure, and the distinction became the basis for Japan's regulatory framework for the telecommunications sector. While the process of privatizing NTT began, the Ministry of Posts and Telecommunications (MPT) retained supervisory responsibilities for both NTT and KDD (which remained a government owned entity) as well as direct responsibilities for postal services, postal savings and

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<sup>168</sup> Id., at 21

<sup>169</sup> OECD (2007) *Reviews of Regulatory Reform: Korea*: 144-145

<sup>170</sup> Id., at 129

<sup>171</sup> Byoung Nam Lee, "Interconnection Models and Practices" ITU Regional Seminar on Costs and Tariffs for Member Countries of the Regional Group for Asia and Oceania (SG3RG-AO) Presentation (2009)

<sup>172</sup> Source: Ministry of Information and Communication, Press release, Sept 22, 2006

<sup>173</sup> OECD (1999) *Regulatory Reform in Japan in Telecommunications Industry*: 6

<sup>174</sup> Susumu Nagai, "Interconnection of Telecom Networks in Japan," *Journal of International Economic Studies* 9 (1995): 1-12

postal life insurance.<sup>175</sup> However, full-blown competition in telecommunications market was far from effective because market entry and tariffs in long distance and international telecommunications were subject to individual licensing or approval from the Ministry.

In 1988 two competitors were introduced to compete with NTT in the mobile market, and in 1994, the Ministry introduced further competition by allowing four digital cellular mobile carriers to enter each of ten separate regional markets. Continuous efforts to liberalize the telecommunications market led the Ministry to allow cable operators companies to offer telecommunications services using their own networks in 1993. In 1996, the Ministry introduced the second stage of telecommunications industry reform that included a break-up of NTT. NTT was reorganized into a holding company of four service providers (NTT East Corporation, NTT West Corporation, the long-distance provider NTT Com, and the mobile phone service provider NTT DoCoMo). As a result interconnection rules were establishment and further deregulation of the tariff notification system was promoted.<sup>176</sup> In 1998, KDD was fully privatized. In 2001, the Ministry of Internal Affairs and Communications (MIC) replaced the Ministry of Posts and Telecommunications and took over the role of supervisory responsibilities regarding telecommunications industry.

### 3.6.1 Termination rate decision procedure

Until 2000, interconnection rates have been decided based on the Activity Based Cost (ABC) accounting system, which was essentially based on NTT's historical costs.<sup>177</sup> Indeed, basing interconnection rates on historical costs discouraged NTT from cutting operation costs and improving efficiency. Thus, the Telecommunications Business Law was once again revised in 2000 mandating that NTT adopt the Long Run Incremental Cost (LRIC) methodology for calculating interconnection rates<sup>178</sup>.

The Telecommunications Business Law was revised yet again in 2003 with the principal aim of abolishing most of classification, registration and notification requirements.<sup>179</sup> Specifically, the prior permission system and the regulatory distinction between network-owning carriers (NTT or other common carriers) and leasing carriers (carriers which don't have their own facilities) were removed.<sup>180</sup> According to the revised Telecommunications Business Law, designated fixed line carriers are required to acquire authorization of the Ministry in order to determine the interconnection rate. Thus, NTT East/West, the regional fixed line services providers of the NTT Group, are obliged to submit the revised interconnection articles that include actual costs and traffics to the Ministry by the end of each year. Then, the interconnection rates are reviewed and approved by Ministry annually with the interconnection tariffs on fees and conditions

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<sup>175</sup> *Id.*, at 6-7

<sup>176</sup> *Ibid.*

<sup>177</sup> OECD (1999) *Regulatory Reform in Japan in Telecommunications Industry*: 24

<sup>178</sup> Yuko Suda (2005), "Japan's Telecommunications Policy: Issues in Regulatory Reform for Interconnection", *Asian Survey*, VOL. XLV, No.2, p.245

<sup>179</sup> Kenji Erik Kushida (2005) *Japan's Telecommunications Regime Shift: Understanding Japan's Potential Resurgence*, BRIE Working Paper 170, p.15

<sup>180</sup> OECE (2004) *Product Market Competition and Economic Performance in Japan*: 31

established.<sup>181</sup> However, designated wireless carriers such as NTT DoCoMo, KDDI are not required to gain authorization from Ministry, but simply to notify the interconnection rates decided by themselves.<sup>182</sup>

The fixed line termination rates per minute in Japan in 2007-2008 ranged from US\$ 0.0138 to US\$ 0.0237.<sup>183</sup>

### 3.7 Discussion

The transition from monopoly controlled to competitive markets in telephony has, as demonstrated, raised similar regulatory concerns world wide: new regulatory authorities have been created and recreated, new communications legislative efforts have been drawn and redrawn, and different access regimes have been experimented with. Indeed, the introduction of competition in local markets has brought interconnection issues to the forefront of regulatory concern and the price of call termination has been central to that debate.

The systems described are different: The European seeks harmonization while maintaining the peculiar differences among the member states, the Japanese and British seek to decentralize a mostly centralized regime, the Israeli and Korean aspire to micro-manage among competing technologies and stakeholders. The peculiarities of the American system – that it is technologically biased, that it is rooted in a market controlled rather than state controlled system, and that it is distorted by the need to overcome the federal/state divide – appear in some way or form elsewhere as well. Taking into account all of the differences among the systems, a common theme can be detected: regulators seek ways to create uniform and simplified systems no matter what the reason for the differences between access regimes has historically been. Thus the fragmented-regional nature of European, British or Japanese system has led way to streamlined national policies, as have the somewhat complicated Korean and Israeli systems in which the fragmentation has been identified among different levels and definitions of service providers. And the controlling dominance of deep-seated national and local monopolies has given way to competitive policies.

Comparisons are an awesome task. It is easy to point out the differences between the systems and to pooh pooh the comparison as irrelevant. However, all the oddities that exist in one system exist in some form in others, and all have eventually led to very similar policies, policies that seek to out weigh the importance of deep-seated distortion. More than that, the price for call termination in all the examples we've surveyed is miniscule, to the extent it can hardly have an effect on consumer behavior.

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<sup>181</sup> Chung Hoon and Na Sang Woo (2007), "Case study: Methodology for assessing the interconnection rate", Information Communication Policy, 19(20) p.19

(정훈, 나상우, "상호접속료 산정방식 해외사례 분석" 정보통신정책, 제19권 20호, p.19)

<sup>182</sup> Shigeki Suzuki, "Japan's Policy Toward Information Society: Telecommunications Market and Regulation", Telecommunications Policy Division, Ministry of Internal Affairs and Communications (2006), Presentation: 9

<sup>183</sup> Source: NTT Corporation, 2007, 2008 Annual Report

As noted in the past, the difference between United States and European telecommunications regulatory regimes can be identified on a few levels: Europeans reassess their policies often; the reassessment is done at the parliamentary level, thus leaving less room for regulatory arbitrage at the administrative level; and the focus in the European debate is on the goal to be achieved and less on the interests of the players concerned and the ways in which they will be affected by the changes.<sup>184</sup> These difference seem to rise in this study also with regard to the Japanese and Korean cases: Constant redrawing of laws, redesigning of regulatory authorities, and focus on a uniform-streamlined policy are central to efficient decision making. While within the Israeli system legislative change is less frequent and no change in the design of the regulator had taken place, innovative policy decisions have been able to overcome distortions that adherence to technological definitions may lead to.

Indeed, there are a number of commonalities among the different access regimes discussed in this study that can serve as a lesson for a regulator and a market seeking clarity: constant clarification and adaptation of policy to changing circumstances; resolve by legislation; reformulation of the jurisdiction of regulatory authorities; decision making at the top national level; overcoming state/regional difference by streamlining of policies nationally.

If there is one lesson with regards to interconnection, the variety of innovative policy solutions worldwide leads to it is that all regulatory agencies see in interconnection a tool for or an impediment to the development of fair competition that contributes to industry growth. LRIC has been uniformly adopted as the methodology for calculating interconnection prices. Some other courses of action included:

1. Identifying the “termination monopoly” and its impact on competition
2. Requiring real cost reports from operators
3. Adopting “Bill & Keep” policies in order to enhance competition
4. Creating reciprocal and even compensatory regimes across operators and technologies in order to assist nascent technologies and fledgling competitors.

Applying these international models to an American scheme requires adjustment of policy at many different levels, both at the policymaking structural level and at the policy itself. Internalizing their ultimate message and value for the sustenance of an even-handed and rational regulatory framework that supports fair competition and growth is, however, almost intuitive.

#### 4. CONCLUSIONS

*“The regulation of interconnection is becoming the paramount tool of government into the reasonably foreseeable future, replacing the regulation of telecommunications retail pricing, the rate of return, or competitors’ entry.”<sup>185</sup>*

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<sup>184</sup> See Schejter, Amit M. From All my Teachers I have Grown Wise and From My Students More Than Anyone Else *International Communications Gazette* 71 (2009): 429-445.

<sup>185</sup> Noam, Eli (2001), Interconnecting the Network of Networks, Cambridge: The MIT Press.

We conclude at the same point in which we started, which has been articulated so well by professor Noam almost a decade ago and that this study has demonstrated: access charges among networks are a central component of telecommunications policy in the United States and worldwide. It is in the public interest to reach a rational resolution for the discrepancy between interstate and intrastate charges as they relate to the termination of calls on rural provider networks.

Current arrangements in Pennsylvania for keeping prices relatively low for rural customers by balancing them on access charges and universal service are fundamentally unsustainable: their economic rationale is flawed; the composition of the telecommunications market and the identity of the players within it is in a constant state of flux; and future trends point to a completely different technological landscape.

Changes in technology, industry structure, and pricing patterns have made the access charge structure poorly suited to provide a framework for current and future intercarrier compensation. Access charges assume that the end user pays separate long-distance and local telephone charges, but most wireless pricing plans and some wireline pricing plans do not distinguish charges for local calls from long-distance calls. Access charges were designed for a technology in which significant costs were incurred to carry telephone calls over long distances, but the costs of bulk transmission have declined so significantly that the cost of transmitting telephone calls may be considered largely distance insensitive.

In addition, access charges were designed for separate local and long-distance telephone companies, but mergers between local and long-distance companies have significantly changed the post-divestiture industry structure. Access charges were designed to keep long-distance charges to the consumer above the cost of providing service and to use the excess revenue to subsidize local exchange carriers through high charges for originating or terminating long-distance calls. But those implicit subsidies have been to some extent replaced by explicit subsidies paid through the Universal Service Fund.

Indeed, the long view suggests entirely new approaches are called for; while alternative models exist, it is incumbent upon Pennsylvanian regulators not to sit and wait. While the FCC has long been considering this matter there is no sign that it is about to act on it, given its many priorities, and while it is true that the FCC's actions are likely to ultimately affect the state, no useful policy purpose is served by further delay in Pennsylvania. Congress may also act on some version of "broadband universal service" which may clarify at least a new vision of the application of federal universal service funds. However, the state has already made arrangements with all its carriers with respect to broadband penetration. Broadband is clearly a competitive business in most places.

Based on the background and research presented in this study, we believe that the challenge Pennsylvania is facing with respect to rural telephone access charges, can be resolved as long as the solution is forward looking, as networks move towards more of an Internet model (peering), and as long as the historic policy of maintaining substantially similar prices for basic residential subscribers irrespective of their location should be respected and, if necessary, that direct subsidies should be provided to subscribers for that purpose.

According to our analysis, it appears that a reduction of intrastate access charges to the national average interstate access charge would have positive outcomes in terms of social and consumer welfare. Among the three cases that we considered, the net change in social welfare is highest for Case 3, parity between the RLECs' and Verizon's intrastate rate. It may however be administratively simple to require parity between the RLEC's own inter- and intrastate rates. To mitigate the concerns of rural ILECs, examples from other states suggest that, as a transitional measure, they be allowed over time to recover lost access revenues from an increased Subscriber Line Charge, if the market will support it. Our simulations show that the increase in consumer bills is likely to be low, a little over \$3 a month. This could be achieved through phasing out increases in the SLC in a tiered manner over a period of time, say 3 years but certainly not longer than five. Alternatively, continued support from SLC may be tied to LEC commitments to invest in advanced telecommunications infrastructures, thus creating incentives for the rural ILECs' transition to a new business model.

There are viable alternative models in other states, at varying degrees of progress, towards moving intrastate access charges to the level of federal access charges, which is a pretty good proxy for cost. Comparative international studies suggest principles about the process for addressing this issue, as well as specific approaches. Recognizing that the U.S. is not Europe or Asia, it may still be possible to learn useful lessons from the way interconnection/access charges – a universal issue – are addressed in other places.

In conclusion: the time is ripe for change; consumers can and should be protected in the process of this change; there are many examples from which to learn and there are specific models that can ensure a just and efficient outcome truly serving the public interest.

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