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UNIVERSAL SERVICE IN THE 1990S

UNIVERSAL SERVICE HAS REMAINED a focal point of telecommunications policy in the 1990s. That has happened not only in the United States but in every other country that has begun to liberalize or deregulate its telecommunications industry. The new policy dialogue is preoccupied with interconnection of competing networks and with the problem of financing universal service “subsidies” in a competitive environment. In the United States, it is also part of an attempt to extend second-generation universal service concepts to the new technologies of the National Information Infrastructure (NII).³⁸⁹ As that book goes to press, new legislation adding a new section to the Communications Act explicitly devoted to universal service is before the 104th Congress.³⁹⁰

That chapter establishes connections between the historical and current policy debates over universal service. The first section shows how current legislation has been powerfully influenced by historical myths. The second section provides a critique of current thinking about the relationship between universal service and competition. The third section argues that the historic choice between dual service and universal service offers a source of fresh insight into the policy problems posed by the growth of a new information infrastructure. The last section shows that the historical evidence also is pertinent to current controversies over access pricing and interconnection in telecommunications.

³⁸⁹ The NTIA Universal Service Working Group, chaired by Larry Irving, Assistant Secretary for Communications of the Commerce Department, held Universal Service hearings in Albuquerque, New Mexico, Dec. 13, 1993, Los Angeles, California, Feb. 16, 1994, and Indianapolis, Indiana, July 12, 1994.

³⁹⁰ 104th Cong., 1st Sess., *The Telecommunications Competition and Deregulation Act of 1995*, version seen by author dated Mar. 28, 1995.

Life imitates art

The first generation of universal service policy (1907-1920) aimed at the consolidation of service so that all telephone users could speak to each other. Since then, universal service was redefined as an industry-government policy focused on putting “a telephone in every home.” Although it was not implemented until the late 1960s, the second-generation universal service policy claimed a mandate from the 1934 Communications Act. And while more than 80 percent of American households already had telephones when it was begun, the second-generation policy claimed credit for making telephone service available and affordable.

While the old Bell system is gone, the universal service mythology it created continues to haunt us. Current policy discourse about universal service is dominated entirely by the second-generation concept. Noting that competing networks undermine the rate averaging and cross subsidies which allegedly produced widely affordable telephone service, it asks how the old subsidy system can be revised in order to make it sustainable in the new, competitive environment.³⁹¹

The historical mythology of universal service is shaping legislation as well as debate. The most recent draft of telecommunications reform law, the “Telecommunications Competition and Deregulation Act of 1995,” would add a new section to the Communications Act devoted exclusively to Universal Service. The goal of this section, according to a committee report accompanying the draft bill, is:

...to clearly articulate the policy of Congress that universal service is a cornerstone of the Nation’s communications system. This new section is intended to make explicit the current implicit authority of the FCC and the States to require common carriers to provide universal service.³⁹²

That statement is unusual in its direct admission that heretofore there has been no explicit legislative authority for the second-generation universal service policy. What is fascinating from a historical perspective is Congress’s determination to react to that fact by modifying the Act so that it conforms to the myth! A policy concept put forward by the Bell system as part of a last-ditch attempt to save regulated monopoly will now be enshrined in a law devoted to “Telecommunications Competition and Deregulation.” The old regulated monopoly system has exacted a posthumous revenge.

³⁹¹ Eli M. Noam, *NetTrans Accounts: Reforming the Financial Support System for Universal Service in Telecommunications*. Universal Service in the New Electronic Environment Symposium, Benton Foundation and Columbia University CITI (Oct.15, 1993). OPASTCO, KEEPING RURAL AMERICA CONNECTED: COSTS AND RATES IN THE COMPETITIVE ERA. (Organization for the Protection and Advancement of Small Telephone Companies 1993). KOICHIRO HAYASHI, UNIVERSAL SERVICE IN JAPAN (in Japanese), RC Publishers, 1994, ISBN4-12-101175-9.

³⁹² Committee Report on the Telecommunications Competition and Deregulation Act of 1995, Senator Larry Pressler, Chairman, Sen. Comm. on Commerce, Science, and Transportation, to Dr. June E. O’Neill, Director, Congressional Budget Office, Mar. 28, 1995.

The tragicomic character of those developments intensifies when one attempts to make sense of the new universal service mandate in the draft legislation. “Universal service” is defined therein as:

an evolving level of intrastate and interstate telecommunications services that the [Federal Communications] Commission, based on recommendations from the public, Congress, and the Federal State Joint Board...determines should be provided at just, reasonable, and affordable rates to all Americans, including those in rural and high-cost areas and those with disabilities, to enable them to participate effectively in the economic, academic, medical, and democratic processes of the Nation. At a minimum, universal service shall include any telecommunications services that the Commission determines have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers.³⁹³

The language is remarkably broad. If the law passes with that wording in place, the nation’s basic communications law will create universal service obligations whenever a “substantial majority” of Americans subscribe to a particular service. The mandate stretches beyond traditional telephony to include virtually any form of information transmission that might exist now or in the future. Presumably, those universal service obligations will continue to be funded via intra-industry price distortions. A process for progressively expanding universal service entitlement claims has been created in the form of a new Federal-State Joint Board, which, in response to political pressure from Congress or interest groups, can recommend subsidies in nearly any segment of the industry. Far from promoting a transition to a more normal, competitive marketplace, the proposed new law could institute a sweeping, permanent expansion of federal and state intervention in the industry.

Historical mythology is only a part of the problem here. The more fundamental factors are the vested interests created by the old system of subsidies: rural, high-cost telephone companies, consumer lobbying groups, educational and library interests, and other constituencies who might benefit from the continuation of non-market revenue flows and who see in the “universal service” concept a new system of entitlements in the information age. AT&T’s equation of universal service with regulatory cross-subsidies and its rallying of the constituencies who benefit from that system will have a lasting impact on the political economy of telecommunications regulation in the United States.

There is more to the problem than political interest, however. The purported conflict between competition and universal service also has some basis in the economic puzzles posed by our current approach to interconnection policy. Here, as before, a historical perspective is useful.

For the past fifteen years, advocates of telecommunications competition have made interconnection to the public network the basis of competitive entry. Economists and lawyers have argued that interconnection to the public network should be made available on a nondiscriminatory basis to competitors as well as end users. Moreover, they have argued that the prices charged for the interconnection of competing networks should reflect only the incremental costs of supplying it.

³⁹³ Draft legislation, at 40, lines 4-20; Section 253 (b).

In effect, they have equated the proper price of network access with the incremental cost of supplying the facilities enabling access.

Competing networks that are given special forms of low-cost access to the public network are able to target only the most profitable markets and leave the supply of access to more costly or less high-volume markets to the regulated carrier. As that happens, the financial surpluses used to finance the higher cost routes and components of the public network will be competed away. At best, each user will be required to bear the stand-alone cost of the particular set of facilities he or she uses. Or, what is more likely, prices will be lowered for competitive routes and raised in the less competitive or noncompetitive ones, regardless of their relative costs.

Faced with that scenario, policy analysts now propose to revamp some kind of subsidy scheme to recreate the effects of the one they have spent the last fifteen years tearing down. Indeed, an unresolved contradiction between the policy goal of promoting competition and the methods of universal service support has plagued common carrier telecommunications policy since the AT&T divestiture. The divestiture destroyed the old separations and settlements system, but recreated many of its economic effects with the National Exchange Carriers Association pool, weighted dial equipment minute (DEM) charges, and the Universal Service Fund. In a partially competitive environment, those measures encourage uneconomic bypass and other inefficiencies, just as their pre-divestiture forbears did.

In order to fix that problem, most economists are proposing some kind of value added tax applied specifically to the telecommunications industry (Noam, 1993; Egan and Wildman, 1993; Einhorn, 1993; Teleport, 1994). An industry-specific tax and subsidy scheme is proposed because support from general tax revenues is not supposed to be politically feasible. The tax would be applied not just to long-distance carriers but also to cellular, PCS, information service providers, and virtually everyone else in the industry. In other words, instead of eliminating the cross subsidies and associated inefficiencies that developed during decades of regulated monopoly, we are now supposed to make them more extensive and generally applicable than ever before.

Critique of the Prevailing View

There are ample grounds to question that approach to the problem. To begin with, the historical data make it clear that the importance of rate subsidies in the development of telephone service has been greatly exaggerated. Most of what happened in the regulatory arena between 1920 and 1970 were ways of sustaining or marginally expanding a level of coverage that was basically established by 1920. The progressive rise in telephone penetration after World War II had more to do with the doubling and tripling of household income during that period than with separations and settlement practices. Active utilization of the separations and settlements process to lower the price of local exchange service did not really begin until 1965. Household penetration was already growing rapidly, and hovered around 80 to 85 percent at that time. The importance of even those subsidies could be questioned. Household penetration has grown steadily since 1984 despite the major increases in local service rates made in the wake of the AT&T divestiture.³⁹⁴

³⁹⁴ Jorge R. Schement, Alan Belinfante & Lawrence Povich, *Telephone Penetration*, 1984-1994, Federal

If the historical impact of subsidies was much smaller than is generally supposed, the case for projecting them into the future can be questioned on the following grounds. The current preoccupation with universal service subsidies masks three serious problems.

First, intra-industry subsidies, regardless of how they are designed, may not be compatible with a free, open, and competitive marketplace. At best, they may create an inherently tilted playing field in which there must always be a designated “carrier of last resort” with special obligations and protections. At worst, they may require that telephone companies in certain areas be franchised monopolies. Panzar and Wildman (1993), for example, argue for leaving monopolies in place in rural areas, and show convincingly how a mixture of competitive entry and universal service subsidies could have unintended and counterproductive effects.

Second, under a subsidy mechanism it may not be possible to distinguish between “high costs” and obsolete or inefficient ways of doing things. Since the provision of service to high cost areas will be removed from marketplace competition, costs must be taken as a given and “covered” by the subsidy. It may be true that, given current applications of technology, factors of density and loop size make it more expensive to provide traditional telephone service in rural areas. But as long as the rural telephone companies are franchised monopolies collecting universal service subsidies, why should anyone bother to develop and deploy radically different, more efficient ways to serve those areas?

Third, the subsidy approach conceals an interesting contradiction. On the one hand, the need for subsidies is based on the assumption that a universal telecommunications network is a costly liability rather than a valuable asset. In virtually the next breath, however, universal access is discussed as if it were a resource so valuable that no competitor can survive without it. Competing networks-competitive access providers, long-distance carriers, and wireless networks-all claim that interconnection to the public network at reasonable rates and with equal technical conditions is essential to their success. Apparently, the ability to terminate calls to any and every telephone user, a capability which can only be supplied by the public network, is extremely valuable. How is it possible that something so valuable and so much in demand is also economically unsustainable? Something is wrong with that picture.

The basis of that contradiction lies in the current property structure, or perhaps we should say the absence of property structure, in the public telecommunications network.

The appropriability problem in network economics

A telecommunications network offers its customers an enormous bundle of services. Under the monopolistic structure, consumers purchased access to all or most of those services at rates which sustained the system as a whole. When competition is allowed, and the competing networks are interconnected, both can offer users the same access scope, despite what may be major differences in their actual scope. That is the source of an appropriability problem. A competitor

who buys only one unit of access into a universal network is technically able to resell access to all of the users connected by the incumbent, even though the competitor does not have to face the costs and risks of creating the entire network. The competitor is thus able to appropriate some of the economic value of the other network's bundle of access units.

As noted in chapters 3 and 5, the appropriability problem in telecommunications is similar in a number of ways to the problem of intellectual property in information markets. Just as the information reseller need not worry about the costs of producing information but only the cost of reproducing it, so the telephone access reseller need not worry about the cost of reconstructing the established network but only about the cost of acquiring enough access into it to handle the traffic between the two systems.

The salience of the appropriability problem hinges upon what the new networks pay for access to the incumbent. If the price of inter-network access compensates the incumbent adequately for its large scope, then interconnection with a competitor does not harm it. If the price a competing network pays is no different than that of any ordinary user, then parasitism may in fact occur. In the 1910s, as we have seen, utility commissions confronted that problem when engaged in the process of establishing toll connections between Bell and independent networks. Their solution was to impose a “surcharge” on inter-network traffic. A surcharge allowed users to overcome the barrier to communication represented by dual service, but the additional expense associated with communicating with members of the other network allowed each network to maintain some degree of exclusivity.

The modern approach to access pricing does not recognize the existence of an appropriability problem. It is more concerned with the survival of small competitors in the face of what it sees as the overwhelming advantages of larger, incumbent networks. Policies based on that view attempt to erase all discrimination between end users and intermediate users and prevent a network from deriving any competitive advantage from its larger scope. Thus, the modern policy tends to exacerbate the appropriability problem, with potentially dire consequences for universal service.

We have seen in earlier chapters that appropriability is not a purely theoretical construct. It played a major role in shaping the development of the American telephone system. Competition between the Bell system and the independents between 1894 and 1920 was structured as a system rivalry between unconnected local exchanges and toll networks. They were not interconnected because the prevailing interpretation of property rights gave competitors the option of deciding whether or not to interconnect with a competitor network. That type of property structure gave both competitors a powerful incentive to make their networks as universal as possible.

A different but related historical lesson is that under access competition, telephone networks often sustained their large scope by averaging rates and costs. Most economists believe that intra-network “cross-subsidies” or transfers of revenues would not exist in a competitive market. That belief is contradicted by the historical evidence. Intra-system averaging seemed to be sustainable as long as the competing systems were not interconnected. During the competitive era, the Bell system established many small exchanges in outlying areas and sustained them in part through toll usage

revenues. That is, it paid the competing networks to add remote exchanges even if the small exchanges did not sustain themselves with local exchange access revenues alone, because the presence of many additional termination points increased toll usage and revenues in other exchanges.

There are more recent indications that universality and rate averaging are not incompatible with competition, given the right property structure. Overnight delivery services such as DHL, FedEx, and UPS are competitive network businesses. The economics of those package delivery services are in some ways analogous to telecommunications networks. Though competitive, those businesses still maintain uniform rates for a broad bundle of services.

The price of sending an overnight DHL, FedEx, or UPS package is the same regardless of whether the package goes across town or across the country. Originally that was the case because (in the case of FedEx, the industry pioneer) all packages went to the Memphis hub regardless of their ultimate destination. But since that time regional sorting centers and package “bleed off” functions have been introduced, which undoubtedly lower the costs of regional or local distribution relative to national distribution. Yet the consumer prices have remained the same because consumers prefer uniform national pricing. Clearly, that kind of pricing system is sustainable in a competitive market.

It is also interesting to note that all of the package delivery services are constantly striving to improve and increase the universality of their distribution networks. Each one recognizes that it is in their direct business interest to provide service to as many places as possible. While service to points outside primary service areas may incur a surcharge or result in slower service, competition forces each network to continually attempt to increase the number of places to which they can provide overnight service at the regular price.

In the overnight express industry, each network competes on a stand-alone basis. There is no price regulation and no common carrier or universal service obligation. It is interesting, but of course inconclusive, to speculate about what the economic impact of a different property structure might be. Assume, for example, that federal regulators required DHL and FedEx to exchange packages; FedEx could require DHL to complete the delivery of FedEx packages if the destination was served by DHL and not FedEx, or vice versa. One suspects that uniform rates would end. Each courier service would serve only those areas which were most profitable for it and leave the rest to the others. One also suspects that the imputed costs each courier claimed to incur by serving the more remote regions would suddenly become very large, particularly if federal subsidies were made available to support them.

In conclusion, market competition and network universality can be reconciled if the telecommunications industry adopts a property structure that allows networks to appropriate the increased value created by enlarging a network’s scope. Since current policies prevent networks from doing that, it is not surprising that the growth of competition seems to corrode the economic foundations of universal service. With the right property structure, universality ceases to be a costly liability and instead becomes a valuable asset.

Why Vail's universal service is still relevant

As noted earlier, widespread acceptance of the second-generation universal service concept has literally buried the older concept. The telecommunications industry is almost entirely unaware of the earlier debate about dual service. Consequently, we have lost sight of why the United States ended up with a monopolistic telephone industry.

The first-generation debate about universal service, however, is far more relevant to the policy challenges of the next two decades than the current preoccupation with financing universal service subsidies. A better understanding of the basic policy choice faced in Vail's era is essential if we are to understand the implications of current developments in information technology.

The new information infrastructure that is under construction is characterized by competing, overlapping, and often incompatible or imperfectly integrated technologies. The typical business card today carries three or four different user addresses—one each for the voice telephone, the cellular phone, the fax line, the electronic mail address, or the pager. There may be additional information about internal, enterprise networks. Compared to that, the advertisements of the dual service era, in which businesses had to list two different telephone numbers, seem simple. Far from showing any signs of abating, the proliferation of communication devices continues with the development of new wireless telephone services, portable personal computers, enhanced pagers, and personal digital assistants. Aside from the efflorescence of devices and applications, the number of service providers is also growing. In fact, no less than four prospective categories of service provider are now contending for a role in developing the information infrastructure: telephone companies, cable television systems, terrestrial and satellite radiocommunications providers, and the internet. How those diverse providers will exchange traffic and achieve technical compatibility is anybody's guess.

Within that increasingly heterogeneous environment, technologists, policymakers, and businesses continue to hold out the promise of total, seamless integration. For more than two decades, we have been told that sometime in the near future a single device and an integrated network will deliver interactive voice, video, and data capabilities everywhere. That vision is, of course, a modern version of the first-generation universal service concept. It assumes that the full panoply of information technology will someday achieve the uniformity, compatibility, and ubiquity of the telephone system of the regulated monopoly era.

It is an appealing vision, and it may even happen, eventually. If we are envisioning a 21st century version of universal service, however, there is much we can learn from the earlier debate between dual service and universal service.

Integration is a Policy Choice, Not a Law of Nature

To begin with, universal integration of the information infrastructure really is a choice we face and not an inevitable product of technology or economics. Even in the era of the telephone, there was an alternative to complete integration—namely dual service. The replacement of dual service by universal service did not come about “naturally,” via routine market processes, but required major institutional innovations (the suspension of antitrust laws, the use of state regulatory

commissions to regulate rates, and later the creation of a new federal regulatory agency). The first-generation universal service debate took the better part of two decades. Those were simpler times, in that we were dealing with only one type of technology (voice telephony), and the policy choice was restricted to one national economy.

It is possible that technological and institutional differences between the past and the present have tilted the social optimum away from integration and towards more tolerance of heterogeneity, fragmentation, and competition. The expansion of telecommunications access can no longer be considered an unqualified good, as it may have been in the era of Vail. As fears about privacy and security grow, and technologies such as voicemail and caller ID gain popularity, one can only conclude that today's users are as interested controlling and restricting access as they are in broadening it. To many people, the indiscriminate intrusion of a universal "information superhighway" into their home or business is about as welcome as the presence of an eight-lane interstate highway in their backyard. We should not assume, as if by reflex, that the new information infrastructure will or should follow the trajectory of the telephone system. At the very least, our policy dialogue needs voices capable of articulating and defending a 21st century version of dual service.

Integration Has Costs as Well as Benefits

A historical perspective can make us more aware of the difficult trade-offs that must be made. Integration involves costs and well as benefits. History suggests that unification is driven by demand-side economies of scope. Compatibility and integration can benefit users by eliminating the need for duplicate investments in terminal equipment and access facilities and by eliminating the confusion and uncertainty caused by heterogeneous products and services. But the realization of demand-side economies of scope also creates market inertia. As the communications infrastructure matures and users converge on a single system or standard, it becomes increasingly difficult for new technologies or networks to gain a foothold in the market. In other words, there is an inherent trade-off between integration and competition.

Thus, it is likely that when the much-ballyhooed seamless integration of the information infrastructure actually arrives, many of us won't like it. The dominance of Microsoft in the software marketplace has already given us some inkling of the problems to be faced. Microsoft's Windows software has succeeded in establishing itself as the standard user interface for most IBM-compatible personal computers. Consumer acceptance of Windows has given the Microsoft Corporation a significant amount of market power in the software and computer industries. Just as AT&T was the perennial focus of antitrust activity from 1910 to 1980, so Microsoft (and more generally the interface between PC, user, and software applications) will become the focal point of competition policy controversies in the near future. In both cases, the economic forces contributing to market power are the same—demand-side economies of scope. The dominance of Windows in the marketplace is derived from users' unwillingness to make duplicate investments in time spent learning how to use different software procedures, just as the dominance of AT&T was derived from users' unwillingness to duplicate their investments in telecommunications access.

Microsoft's success has been achieved in what is really only a small subset of the overall market for telecommunications and information. One can scarcely imagine the amount of market

power that could be achieved by a company which succeeded in winning mass acceptance of a standardized software application and terminal for accessing and navigating a fully integrated, global information infrastructure. If and when that occurs, the tension between demand-side efficiencies and supply-side diversity may reach some kind of breaking point (as occurred between 1912 and 1920) and impose a policy choice upon us.

Unfortunately, the prevailing thinking about competition policy does not offer much help in making such a choice. The theoretical roots of antitrust policy are derived from natural monopoly theory. The natural monopoly doctrine, as we have seen, is only equipped to identify and remedy anti-competitive behavior based on supply side abuses such as predatory pricing. Current antitrust doctrine gives us little guidance as to how to handle monopolies that originate in demand-side economies of scope. That is why the relationship between communications monopoly and the antitrust laws has always been so ambiguous historically.

History Never Repeats Itself

There are three important structural differences between the first generation universal service debate and what might be called the “third-generation” confrontation with that issue in the future. Although the parallels are significant, the differences need to be kept in mind as well.

One important difference pertains to the globalization of information and telecommunications markets. The institution of telephone monopoly was a response to the problem of creating a comprehensive and uniform communications capability across political units known as nation-states. Historically, the response to that challenge in the telecommunications sector was surprisingly uniform across the globe. In practically every nation, post, telephone and telegraph (PTT) monopolies were created so as to make the telecommunications infrastructure an extension of the national state.³⁹⁵

The national PTT system lasted for eighty years, but is currently being eroded almost everywhere in the developed and developing world. As the PTT system breaks down, the old tradeoff between fragmentation and competition versus integration and monopoly is being faced once again. But the developmental process that took place at the national level in the industrializing nations of the late 19th and early 20th century is now taking place at the international level. The liberalization of the sector allows companies to enter multiple national markets. In response, telecommunications service providers and manufacturers are becoming horizontally integrated across nations. That gives the 21st-century equivalent of dual service competition an added level of complexity. At the global level, there is more room for competing systems and standards to take hold, and it is more difficult for user convergence to take place in a coordinated fashion. On the other hand, the stronger linkage between national markets and the transnational integration of firms makes it impossible for one country to ignore the systems and standards established in another.

Wireless personal communications hold the promise of the ultimate in universal service-two-way telecommunications that are available at any time in any part of the world. But the

³⁹⁵ Peter Cowhey. *The International Telecommunications Regime: the political roots of regimes for high technology*, 44 INTERNATIONAL ORGANIZATION 69-99 (Spring 1990).

promise of ubiquity is undermined by the development of competing, incompatible wireless telephone standards in Europe, the United States, and Japan. The same thing is happening with High Definition Television standards. The desire for and benefits of global compatibility are strong, but business competition, technological diversity and national industrial policies make unification elusive. As information technology matures and the international economy becomes more dependent upon its capabilities, is it not possible that some sort of universal service drama will be acted out once again, on a global scale? Of course, it is impossible to predict what kind of institutional form will result.

The nature of technology is another important difference between the past and the present. One of the key economic features of the first-generation dual service-universal service debate was the diseconomy of scope associated with the growth of networks. Both manual and electromechanical switching technologies became increasingly expensive to operate and maintain as the scope of a network grew. The older, analogue technology also made the achievement of compatibility between equipment and network more delicate and difficult to achieve. In that context, vertical integration and monopoly may have been the most efficient ways of bringing about the demand-side economies of scope that users wanted.

Electronic and digital switching systems have conquered the supply-side diseconomy of scope, however. The unit cost of serving a given number of access lines actually declines now with the new technologies. In addition, digital signal processing is more robust and more easily interconnected and standardized than analogue or manual systems. In the present environment, it is easier to achieve various levels or gradations of compatibility and interconnection. Thus, it is unlikely that users will be confronted with the stark, binary choice of interconnection/no interconnection as in the past. That does not mean, however, that the dual service-universal service debate is not relevant to current policy problems or that we can effortlessly have the best of both worlds. The dynamics of access competition still apply today. The impact of interconnection policy on competition and universal service in telecommunications are two areas in which historical parallels are extremely important and instructive. They will be discussed in the next section.

Last but not least, the political economy surrounding telecommunications policy is radically different now than it was in the early 1900s. After nearly thirty years of the second-generation universal service policy, strong vested interests in telecommunications subsidy schemes have been created. Small, rural independent telephone companies, for example, provide a well-organized and surprisingly influential lobbying presence on Washington. Activist organizations devoted to the special interests of the blind, the deaf, libraries, schools, and household consumers also are able to articulate subsidy claims and lobby for them in regulatory and legislative proceedings. The organized activity of those groups helps to explain why the cross-subsidies of regulated monopoly period have proven to be virtually ineradicable, despite the nominal dedication of regulators and Congress to competition and deregulation.

Interconnection of competing networks

The issue of access pricing between competing networks has emerged as the preeminent telecommunications policy problem of the present day.³⁹⁶ The prevailing view of telecommunications competition, however, turns the older viewpoint on its head. Where Bell and the independents actively competed on the basis of their scope, current policy strives to ensure that no network can derive a competitive advantage from its “bottleneck” control of access. Current regulatory practice stresses pricing based on incremental costs and goes to great lengths to impose equal technological conditions among competing networks.

That doctrine purports to give us the best of all possible worlds. “Open access” will foster competition but without the fragmentation of the dual service era. It will provide universal service, but without monopoly or even, perhaps, much regulation. Here again, the vision is appealing but its practicality is suspect. The prevailing doctrine of open access rests upon theoretical and historical assumptions which have been called into question in that book.

Historical Lessons

Historical evidence provides limited support for much of the prevailing wisdom concerning interconnection and competition. We assume that an incumbent network’s refusal to interconnect with a new competitor is intrinsically anti-competitive. But Bell’s refusal to deal with its competitors did not foreclose competition. Despite its seventeen-year head start and its superior capital resources, Bell’s total exclusion of the independents from its system did not deter, and may actually have stimulated, their explosive growth. (Of course, that growth occurred in a market with plenty of room for additional development.) Furthermore, the effects of access competition were not so negative-noninterconnection promoted universal service by rewarding systems for enlarging their scope.

Current doctrine also is strongly committed to unbundling and interconnection among competitors, assuming that it is always conducive to consumer choice. Historically, however, competition in the local exchange market was discouraged and sometimes eliminated by interconnection. Specifically, Bell’s sublicensing of independent exchanges was the most damaging blow to the independent movement, as it removed much of the incentive to develop an alternative system. That experience also suggests that the modern assumption that dominant incumbents have no incentive to interconnect with smaller competitors is incorrect. Without any prodding from regulators, Bell progressively liberalized its interconnection terms and conditions from 1901 to 1912 in order to prevent an alternative system from developing.

An understanding of those points, sometimes tacit, sometimes explicit, led early telephone regulators and users to reject a telephone industry structure based upon compulsory interconnection of competitors in the early 1900s. The industry and its early regulators did consider, and in some

³⁹⁶ Werner Neu & Karl-Heinz Neumarm. *Interconnection Agreements in Telecommunications*, in DISKUSSIONSBEITRAG NR. 106. (Wissenschaftliches Institut für Kommunikationsdienste April 1993); Milton Mueller, *New Zealand Telecommunications and the Problem of Interconnecting Competing Networks*, POLICY STUDY No.177 (Reason Foundation 1994); Martin Cave, *Interconnection, Separate Accounting, and the Development of Competition in UK Telecommunications*, Institute of Economic Affairs Lectures on Regulation (1993).

cases even experimented with, interconnection. But regulatory experience in the United States and Canada tended to confirm the observations made in the preceding paragraph. In addition, regulators were unwilling to accept the high costs associated with implementing interconnection.

That book has retrieved and elaborated on the older approach to interconnection policy in order to illuminate the current debate. The intention is not to argue that the older views are perfectly correct or that they are directly applicable to the current situation. They do, however, help us to understand some of the weaknesses and problems inherent in the modern approach to interconnection policy. We need to have a dialogue, not a monologue, about that vital aspect of telecommunications policy. Much can be learned by using the older approach as the point of departure for a critique of contemporary policies.

Nondiscriminatory Pricing and Appropriability

We have already discussed how the modern approach to interconnection creates an appropriability problem (see section entitled THE DEBATE OVER UNIVERSAL SERVICE “SUBSIDES”). Indeed, it is clear now that incremental cost-based interconnection pricing, while it has some legal and theoretical support from concepts of nondiscrimination and common carriage, has succeeded among regulators largely for political reasons. Politicians and regulators who introduce long-distance competition develop a vested interest in the viability of the new competitors and want to be able to deliver quick and visible price reductions to consumers. Incremental-price based interconnection readily supports that agenda. New competitors can provide substitute facilities only on a few long haul routes while benefiting from the universal access of the incumbent. Under those conditions it is easy to undercut the price of the incumbent, particularly when the incumbent is a government monopoly or has a long history of overpriced long-distance rates.

Quite apart from its political motives, that policy has several economic advantages—it eases the entry of new firms in the telecommunications market, thereby putting pressure on the incumbent to improve its service and rationalize its prices. Those advantages apply even if the new networks are not actually more efficient than the older one. In the long run, however, the appropriability and universal service problems inherent in such an approach cannot be ignored, particularly when competition enters local access as well as long-distance markets. Thus, the modern approach to interconnection really has not avoided or superseded the concerns about appropriability expressed in the early 1900s.

Recognition of that fact is indicated by the growing debate over “efficient component pricing” as the theoretical basis for access pricing. The efficient component pricing rule was developed by the economists William Baumol and Robert Willig, initially in the context of railroad regulation.³⁹⁷ In that pricing methodology, competing networks pay incremental costs plus an opportunity cost, representing the foregone profit that the incumbent loses by extending service to a competitor. Compensation for opportunity costs allows the incumbent to appropriate the value of its larger scope. Although its theoretical derivation is more precise, the principle of efficient

³⁹⁷ WILLIAM J. BAUMOL & J. GREGORY SIDAK, *TOWARD COMPETITION IN LOCAL TELEPHONY* (MIT Press & AEI Press 1994).

component pricing is similar to the surcharge concept employed by utility regulators eighty years ago. The Baumol-Willig pricing rule is still controversial,³⁹⁸ and its widespread adoption is by no means assured. Nevertheless, the regulatory climate is being nudged closer to the older position regarding appropriability than it was.

Whatever the specific merits and demerits of the Baumol-Willig proposal, a sustainable access pricing regime cannot require telephone companies to make access available to competitors at a price that reflects only the incremental costs of the facilities used. To do so would be as fallacious as requiring software producers to base the price of their product on the cost of producing and distributing the floppy discs that carry the software. In both types of markets, the marginal cost of extending access to an additional user is very low. But to make the product available to competitors or resellers at such a price is unsustainable. It is necessary and legitimate for the owners of the information resource to price discriminate depending on whether or not the user intends to resell it. That is true even though there is no difference in the incremental cost of supplying access to a reseller or an end user.

Unbundling

Unbundling is the mantra of current policy. Its hopes for a completely open, deregulated telecommunications marketplace are pinned to the process of separating out the components of the public network so that consumers can assemble the services they want and need, and no supplier can use its power in one service area to control another.

That book has provided the outline of a theoretical critique of that policy. As discussed in chapter 3, networks by their very nature are enormous bundles of heterogeneous access units. Consumers benefit from a service provider's ability to deliver multiple services over a single access facility. Economies of scope, on both the demand side and the supply side, are the very basis of network efficiencies. That theoretical groundwork has two important implications for contemporary policy.

First, if networks are bundles then a policy that equates bundling with restrictions on competition is bound to find anti-competitive behavior everywhere. Such a policy will be perpetually at war with the very basis of network efficiencies. We need a much clearer standard for determining when bundling constitutes a barrier to competition than is currently available. Moreover, such a standard needs to take into account the positive social value that can be derived when networks compete on the basis of the size of their service bundle, as the Bell system and the independents did in the early 1900s.

Second, although breaking apart the components of a network does give users more choice and control over the nature of the bundle, that shift of responsibility entails costs as well as benefits. Every act of unbundling creates additional transactions costs for users. A modem consumer of telecommunication network services and functions who must assemble various

³⁹⁸ 11 YALE J. REG. (1994), contains several articles supporting and critiquing the efficient component pricing rule.

elements himself is faced with decisions which require costly information and time. On the supply side, unbundling may also sacrifice economies of scope.

It is instructive to compare the economic effects of modern network unbundling with those of dual service competition. In the dual service era, the costs of integration were entirely shifted to users who had to buy duplicate access facilities. In the modern approach, those costs are internalized by the public network. Duplications of facilities still exist—they have just become invisible to the user and the costs are distributed among users in unaccounted for ways. For example, the existence of competing but interconnected local exchanges requires additional signal processing and transport facilities to handle traffic between the systems. Those facilities would not, in principle at least, be necessary in an optimized single system. The implementation of equal access arrangements and number portability also require heavy investments in transport-signal processing and switching capabilities that would not be necessary otherwise. Whether that regime is more efficient than an alternative such as dual service is outside the scope of this book. We do, however, need to pay closer attention to the trade-offs involved in mandated unbundling. The current doctrine may impose upon consumers and suppliers an economically inefficient level of unbundling.

Interconnection Policy, Regulation, and Property Rights

Open access was supposed to pave the way for market competition in telecommunications. But the current approach to interconnection has not done away with regulation. Far from implementing equal access and “fair” interconnection pricing have generally increased regulatory intervention in the industry. Increased regulation is an unavoidable byproduct of the basic assumptions of the policy. If incumbent networks hold insurmountable, “bottleneck” control over access, then unregulated market transactions cannot be relied upon to set prices. If regulators are to fill the gap, long and usually inconclusive deliberations about the identification of costs are required. The arcane debates about pricing pale in comparison to the complex forms of intervention in the technical structure of the network that have been necessitated by the open access policy. Interconnection of competing operators is seldom possible through the purchase of pre-existing types of service from the incumbent. It usually involves new forms of access and interoperability for which no established market or prices exist. Thus, regulators have been forced to reach deeply into the structure of the public network in order to create, by fiat, an intermediate market for telecommunications access. The implementation of equal access, for example, required the creation of artificially defined territories known as Local Access and Transport Areas (LATAs) and the restriction of local exchange telephone companies to those territories. At the local exchange level, equal access interconnection requires that regulators take control of numbering plans, mandate deployment schedules for certain kinds of switching and signaling technologies, and even regulate the number of seconds it takes to process a call.

True deregulation in telecommunications will never be possible without a competitive, unregulated market for interconnection and access. This book has shown that unregulated access competition is not an unthinkable option. The applicability of America’s historical episode of access competition to the present time increases as alternative infrastructures, such as cable television systems and wireless telephone companies, proliferate. The idea that no firm is capable of duplicating the local access network of the telephone company is looking increasingly dated. In

addition, the computer industry now provides a model (although not, of course, a perfect one) of how compatibility, interconnection, and unbundling can be achieved without pervasive regulation of terms and conditions.