Telecommunications Access in the Age of Electronic Commerce: Toward a Third-Generation Universal Service Policy

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I.Introduction

For the past three decades, universal service policy has centered on the humble copper wire, or more abstractly, on the idea of a line into the home. Gigantic cables connected cities and continents; from there, rivulets of twisted copper wires wended their way through millions of streets to users. The basic social policy questions were: Is the wire there or not? What must be done to get it there? Can people afford to pay for it?

The United States and many other countries are in the midst of remaking their universal service policies.[1] Unfortunately, these exercises in policy adjustment have not been very creative. Like generals preparing to fight the last war, regulators in the United States and elsewhere are working hard to update and rationalize the cross-subsidies of the old monopoly system to make them compatible with competition.[2]

A conception of universal service that centers on the wire into the home, however, is no longer meaningful. In all but a tiny handful of remote locations, universal communications access has little to do with the presence or absence of physical facilities. The infrastructures of telecommunication are proliferating in number and expanding in capacity at an unprecedented rate. Furthermore, a growing body of research suggests that the rental price of the access line is not the decisive factor affecting the affordability of service. The notion that universal service hinges on regulatory subsidies to facility construction or to access line rentals seems oddly out of touch with contemporary conditions.

The most important universal service issue now and for the foreseeable future concerns how people will access and use the infrastructures that surround them. Gaining the ability to access communications facilities when and where they are needed requires an account relationship between the supplier and the user. The account relationship, I submit, should be the focal point of universal service policy today. As is often the case in the world of digital networks, the most important issues revolve around software, not hardware: access hinges on processes such as account verification, credit authorizations, billing, and collection. The most appropriate symbol of universal service is not the copper wire but the card: the credit card, the debit card, the SIM card (or "smart card"). Universal service issues should be viewed within the context of the rise of electronic commerce. This Essay explores some of the issues raised by the convergence of card-based commerce and telecommunications access.

II. Prior Generations of Universal Service Policy

By way of background, it may be useful to look at universal service policy historically, as a succession of different policy generations. The notion of a "policy generation" is adapted from the vocabulary of communication engineers, who like to refer to generations of technology succeeding each other.[3] Universal service policy has already gone through two distinct generations. Each was a response to a specific set of problems posed by that period's economic, political, and technological conditions. My argument is that it is time to formulate a new, third-generation policy.

A.First generation (1907-1965)

The first-generation universal service policy was a response to the problem of competing telephone systems in the early 1900s.[4] Telephone competition posed a "universal service" problem because the competing exchanges refused to interconnect with each other. Interconnection of competing networks was not perceived as a viable option at that time. The telephone companies, and most legislators and regulators, agreed that intercommunication among all telephone users required a single franchised telephone system in each community. "Universal service" at this time was about connectivity-it meant that all telephone subscribers should be able to talk to each other. Its chief expression in federal law was the 1921 Willis-Graham Act,[5] which exempted telephone companies from antitrust laws so they could merge into a single system. The main concern of the policy was not the level of household telephone penetration, but the user fragmentation created by competing systems. From about 1915 to 1925, competing local exchanges were merged into

territorial monopolies and linked into a nationwide system. Regulation was used as a substitute for the price and service incentives of competition. At this stage, utility regulation was not linked to a policy of promoting household telephone penetration, nor was the term universal service linked to rural-area subsidies.

B.Second generation (1965-present)

The second generation of universal service policy emerged out of the way regulators handled the revenue flows and cost accounting relationship between local and long-distance service and the state and interstate jurisdictions. After World War II, as the costs of long-distance service dropped and the costs of local service increased, regulators and politicians preferred to hold down local rates using the surplus generated by long-distance. There was no legislative basis for this policy; it was a response to political pressures placed on regulators.[6] When these cross-subsidies were threatened by the rise of long-distance competition in the 1970s, telephone companies tried to defend their monopoly privileges by claiming that cross-subsidies were essential to the preservation of widespread household telephone penetration. The term "universal service" was dusted off and given a new meaning; a telephone in every home. Universal service policy came to mean manipulation of rates by regulators to deliver access subsidies to rural and household users at the expense of urban and business users.

The second-generation policy assumed that the monthly line rental was the key to the affordability of telephone service. Consequently, the policy was willing to tax usage to subsidize access. It assumed that a significant number of users could not afford to pay the real cost of the monthly line rental, especially in rural, high-cost areas. Finally, it assumed that there is only one form of telecommunications access that really counts, namely telephone service. The telephone system was treated as an essential facility, like electric power and water supply.

While the second-generation policy was never part of the Communications Act of 1934,[7] it clearly was the inspiration for section 254 of the 1996 Telecommunications Act.[8] The new Act attempts to codify the second-generation concept of universal service while reconciling monopoly-era cross-subsidies with the demands of a competitive marketplace. Thus, the law puts the words "universal service" into the Communications Act for the first time, and codifies the second-generation idea that regulators must make telecommunications access "affordable." It also writes into law the geographic rate-averaging of the old system, and even extends the idea of geographic nondiscrimination further to include the deployment of advanced services. Although it calls for a new, continuously updated definition of universal service, the 1996 law's approach to universal access really is based on old, second-generation assumptions. Instead of recognizing the growing diversity of networks and access methods, it assumes that a digital broadband network will, like the telephone system of the past, reach into every home with a uniform grade of service, allowing the population to be neatly categorized into those who can afford this level of service and those who cannot.

C.Third-generation realities

An analysis of the characteristics of the new telecommunications environment raises serious questions about the applicability of the second-generation policy. First, it is evident that there will be a growing number of telecommunications access technologies and systems. This is true even if one excludes one-way entertainment services from consideration and restricts the scope of universal service policy to two-way, interactive services. The traditional fixed telephone network, cable TV systems, cellular and PCS voice systems, and a wide variety of wireless data systems are all actual or potential providers of basic communications access. Internet service is yet another important form of telecommunications access. Although it is delivered to end users via telephone lines it does represent a distinct service. Let us not forget access to banks and other financial institutions via cards and networks. In the age of digital money, this type of telecommunications access is as important as any voice channel.

Telecommunications access is no longer one simple, homogeneous thing. It is becoming increasingly specialized and heterogeneous. Those who predicted that electronic communications would all "converge" into a single, broadband, integrated network are plainly wrong. Access is diverging into many different forms. Most people will consume more than one of these access technologies. They may have a fixed voice service at home, but they will also have some kind of data communication account, and/or a pager account, a telephone credit or debit card, an ATM card, and some kind of entertainment-oriented video account or subscription. Users will want to be able to move in and out of different types of networks depending on which one is most appropriate to their needs at a given time.

Second, nearly all of these different network infrastructures will be competitive; that is, they will have multiple suppliers. Thus, in addition to consuming a variety of specialized types of telecommunications access, users will expect to be able to move more or less easily between competing networks of the same type.

Within this environment of heterogeneous and competing networks, the most important issues are:

1. The account relationship.

What kind of an account relationship exists between the users and a given supplier? The infrastructure(s) will be there. The question is whether a particular user can gain authorization to use it. Is it a credit account or a debit account? Under what circumstances is the supplier willing to extend a line of credit to the user? Upon what criteria will users be denied access or usage rights?

2. Usage-related costs.

How much does it cost to use the network at a given time and place? The literature on telephone disconnection makes it clear that the build-up of usage charges over time, not the monthly line rental, is the biggest economic factor driving the economically marginal off the network.[9] A related issue is the extent to which usage charges and fees capitalize on the ignorance of users as they move from network to network and supplier to supplier. The abuse of payphone-based, long-distance charges by alternative operator services is a well known example of this type of problem.

3. Account portability.

How portable is the account relationship across different infrastructures and suppliers? Are users "locked in" to a supplier by technical incompatibility, communication protocols, proprietary software standards, internetwork fees, or plain old refusals to deal? Internetwork fees in ATM card networks exact a toll on portability by charging users one dollar or more for every transaction outside the issuing bank's ATM network. To what extent do network usage charges and/or fees discriminate against people who cross network boundaries, and to what extent are these fees justified by costs or the competitive requirements of product differentiation?

Thus, if we picture a low-income, inner-city resident in the near future (or even in the present) we are likely to see someone surrounded by high-tech infrastructures-wireless and wired; data, voice, and video; local and national. But as this person moves among the ATM machines, computer terminals, mobile base stations, tele
phone lines, and cables of the city, the only portal into this world she is likely to find is the gritty, neighborhood coin-operated payphone. The great obsession of the second-generation policy, the cost of the monthly line rental into the home, is probably the least significant economic factor affecting access and usage in this environment. The FCC's current belief that such people will be helped by expanding the definition of universal service and subsidizing suppliers to make access more affordable is just as misguided. For the poor, the main barriers are the unrecoverable fixed costs of establishing the account relationship (deposits, installation fees), the cost of usage, and the risk of losing control over the level of usage, which can lead to a poor credit record and disruption or destruction of the account relationship. Aside from that, most people spend a large portion of their waking hours outside of the home. The poor as well as the rich are, of necessity, in a distributed economy which is increasingly mobile. A universal service policy which privileges access at home to the exclusion of other places is hardly worthy of that grand term, universal.

From the supply side, however, there are important reasons why networks might want to create barriers to access and usage: to protect themselves from fraud, to reduce the risk of uncollectible accounts, to gain a competitive advantage, or to differentiate their service in the market. Thus, any third-generation policy has some important trade-offs to consider.

In this context, the second-generation idea of a common utility with a universal service obligation fulfilled by means of a fixed infrastructure and financed through intra-industry cross-subsidies to access rentals is simply irrelevant. We need a new generation of policy that focuses on the account relationship.

III. The Phenomenon of Card-based Access

The market is already moving into the third generation. In order to prepare the reader for a discussion of the impact of cards on the economics of telecommunications access and universal service, this section describes the growth of card-based access in telecommunications and in the surrounding society.

A.Debit cards

The prepaid telephone card is a market development which has more profound universal service implications than the entire 1996 Telecommunications Act. Prepaid phone cards are usually debit cards; *i.e.*, users pay in advance for the right to make toll or local telephone calls and the payment is recorded in an account which is debited as usage occurs. (Some cards are "stored value" cards, wherein the money value is stored directly on the chip or magnetic media of the card itself.) Cards are sold in denominations of $3 to $100 at convenience stores, copy centers, gas stations, drug stores, truck stops, and newsstands. In its most common form, users receive a card with an 800 number and an authorization code printed on it. Card owners dial the toll-free number to reach a switch operated by the card issuer, then punch in their authorization code. After a recorded message tells them the value remaining on the card, they dial the number they want to call. Cards have an expiration date, after which they are invalid.

There is a great deal of variation in the technology. Sometimes the card can be "recharged" over the telephone using a credit card. Others have to be "recharged" by the retailer, while others are disposable. Some cards simply have the authorization code printed on it, which allows anyone who breaks into the packaging and records the code to illegally use the account after the card is purchased. Others cover the authorization code with a "scratch-off" coating. More sophisticated "smart cards" can eliminate the need for PIN authorization codes but require special terminals with both magnetic and chip-reading capabilities.

Telephone debit cards got their start in the United States as a promotional item. Advertisers would issue debit cards with free long distance time and printed advertising on the front of the card. A few years ago promotions accounted for 85 percent of the United States market and retail sales only 5 percent. By the middle of 1996, however, retail sales of telecards accounted for 50 percent of the market and its proportion was still growing. The total prepaid phone card market (including the value of marketing, production, and related transactions) was expected to exceed one billion dollars in 1996. Retail sales account for about $400 million of this. One of the key market segments driving this growth was inner city immigrant populations who wanted to make international calls to relatives. This is also one of the population segments with the lowest telephone penetration rates.

The usage charges for debit cards are cheaper than collect calls, international credit-card calls, and coin calls. But they are more expensive than direct dialing from a home account. The reason is that debit card providers buy 800 number service and wholesale long distance service from carriers and resell it at a markup. They must pay for two calls: the incoming 800 call and the outgoing long-distance call.[10] There is some evidence that competition is pushing down prices. In mid-1996, Sprint's fifty cent per minute rate was one of the lower offerings. By September, however, Pac Bell was advertising a forty cent per minute flat rate for local, local toll, and domestic long-distance, and six-second billing increments. Some providers advertise rates as low as twenty-five cents per minute.[11] The rapid expansion of the debit card market has created problems as well as benefits. In at least six major cases, phone card operators have sold cards to consumers without fulfilling their service obligations.[12] After buying cards, customers discovered that the 800 access line was always busy or had been disconnected, and that the customer-service lines were unreachable. In most of these cases phone cards were rendered inoperable by the underlying long-distance carrier because the card issuers were not current in paying their bills for usage. The victims were mostly immigrants, minorities, and the inner-city poor who buy phone cards at delis, bodegas, newsstands, and check-cashing places. When the cards turn out to be worthless the buyers are usually unable to have their money refunded by these small retailers.

In fact, what may appear to be a simple shift from a line of credit to prepayment actually involves a complex chain of transactions. Disconnection of phone cards, like disconnection of local residential phone lines, most often occurs because users, in this case the card-issuing company, fail to keep current in paying their bills for usage. Long-distance carriers typically require large deposits from the intermediary card issuers to protect themselves from losses. Thus, while debit cards allow the final consumer to avoid the up front costs and deposits associated with establishing an account relationship, they merely shift this burden to an intermediary. When this intermediary's service is suspended,

end users risk losing their prepayment.

Various remedies are being explored. In February, 1996, the Florida Public Service Commission (Florida PSC) opened Docket No. 960254-TL to study what should be the proper form of consumer protection regulation for prepaid telephone cards.[13] A workshop with the Florida PSC, the Florida Attorney General's Office, the United States Telecard Association, and numerous companies who market prepaid telephone cards was held June 3, 1996.[14] The International Telecard Association is exploring the possibility of creating an official seal and a guarantee for member organizations. A more technically oriented fix is proposed by Comtel Debit Technologies, whose daily metered billing service automatically transfers funds between the banks of the carrier and the card-issuing company based on metering of actual phone card usage.[15]

B.Card-Based Access in Wireless Services

The importance of credit risk and account relationships in mediating access and usage is even more evident in newer services such as cellular telephony. Because of the higher prices for usage, cellular providers use credit bureaus to verify the credit records of applicants for service. According to one cellular provider, approximately 25 to 30 percent of all applicants do not meet the criteria for establishing service and must be asked for a cash deposit. If the deposit is set at $250, only about 8 percent of the disqualified group can be activated for service. If the deposit requirement is in excess of $250, only 2 percent of the disqualified group can be activated.[16] At any given time, about 15 percent of all cellular customers are delinquent. Whenever cellular companies loosen up their activation criteria that number quickly rises.[17] The cellular industry's exposure to fraudulent usage stemming from stolen account numbers and authorization codes runs into billions of dollars each year.

Management of the account relationship is thus one of the most critical factors affecting the viability of mobile telecommunications service providers. Credit risk severely limits the size of their eligible customer pool and imposes huge costs in the form of customer screening, billing, collection, and fraud expenses. Consequently, cellular companies are exploring new payment systems based on smart cards, debit cards, and credit cards. This change is facilitated by the industry's migration to digital technology.

A company called Prime International Products/PICK Communications, for example, is already providing prepaid cellular telephone time and leased cellular telephone terminals for a single up front fee. The company's service allows users to avoid monthly access rentals and the credit authorization process now required to obtain a cellular telephone. PCT has in mind a high-end market niche of business travellers who need a cellular phone for a week or a month. As wireless service expands, however, such arrangements may be expanded to a mass
market just as telephone debit cards have been.

The European digital cellular technology known as GSM has employed smart cards (known as SIM cards) since 1991. SIM cards are credit-card-sized devices which can be inserted into any compatible cellular terminal. They contain the personal account information and user data required to authorize and bill for usage. The SIM card arrangement is more like a portable telephone account, however, and as such is more akin to a charge card relationship than a debit card. Smart-card trials based on the American digital cellular standard known as CDMA are taking place in Korea. In short, the idea of a card that is detachable from the actual telephone set or line is well on its way to becoming a common feature of telecommunications access in mobile telecommunications.

C.Credit and Charge Cards

The traditional account relationship between users and local and long-distance carriers is structurally similar to a charge card such as the American Express card. Users with a valid account have an open line of "credit" but must pay off all outstanding charges within thirty days of receiving the monthly bill. Telephone calling cards generally mirror this account relationship. Calling cards simply enhance telecommunications access by making it possible for users to be billed for calls made from telephones in locations other than that of the home account. Like the home account itself, the calling card is an open line of credit with no specific credit limit and no revolving interest charges. Although customers paid high premiums for the convenience of using telephone calling cards, the number of cards in circulation

doubled from 1986 to 1991, to 100 million. Until the rise of the debit card, the only alternatives to calling cards were collect calls, or carrying around lots and lots of coins.

Recognizing the tacit convergence of credit card and telecommunications usage markets, AT&T issued its Universal Card in 1990. The Universal Card combined calling card features with the characteristics of a revolving credit card account. Banks were initially distressed by the initiative; however, the telephone giant's foray into credit card markets proved less significant than the banks' movement into telecommunications. Visa, Mastercard, and American Express all offer calling card features on their charge and bank cards.

A war of words between AT&T and the local exchange carriers (LECs) during the summer of 1996 provides interesting insights into the characteristics of competition in the age of card-based access. Agreements between AT&T and the LECs allowed AT&T calling card holders to make card calls simply by dialing "0" and the phone number. In mid-1996 AT&T began to nullify those agreements, requiring customers to dial 1-800-CALL-ATT to complete card calls. Customers who were not aware of this change suddenly found that their standard practice of dialing 0 and the number no longer worked. The LECs fielded many complaints from these customers. A United States Telephone Association spokesman charged that "AT&T is forcing its calling card customers-a child calling home after school or a professional at a meeting calling the office for messages-to use the long distance company's network for a local or toll call and then turning around and billing that customer with a surcharge that in some markets can be 80 cents or more over and above the basic rate per minute."[19] AT&T's stated motive in terminating the mutual card holding agreements was to make sure that its customers were actually being connected to AT&T's long-distance network when they used the AT&T card. AT&T officials claimed that some LECs were exploiting the "dial 0" access to sell their own network services to AT&T card customers. To put it in favorable terms, AT&T wanted to maintain brand identity and guarantee a certain quality and type of service. To put it in unfavorable terms, AT&T wanted to exploit the link between the account relationship and telecommunications access to lock its customers into its own network and exact premium charges.

D.Broader Societal Applications of Cards

The use of smart cards and debit cards to access services goes beyond telecommunications, of course. The growth of card-based electronic commerce has important implications for universal service policy. First, access to telecommunications usage may become bundled with many other transactions, which could have either positive or negative implications for expanding telecommunications access. Second, cards could be used to deliver government-sponsored universal service subsidies.

In Spain, approximately forty million smart cards are being issued to replace paper documents covering pensions, social security payments, employment, and health benefits.[20] In the United States, twelve states were operating programs to distribute food stamps and other government benefits through smart cards in 1995. More than twenty are expected to be doing so by 1997.[21] Electronic Benefits Transfer (EBT) is expected to save government money by reducing fraud and by automating accounting processes. One interesting policy issue is whether Regulation E of the federal Electronic Funds Transfer Act applies to EBT. Regulation E shields bank customers from fraudulent use of ATM and credit cards by limiting their liability to only fifty dollars. Banks must swallow the rest of the loss.[22]

Regardless of the short-term fate of EBT, it is evident that smart cards will eventually mediate a large part of our relationship to state governments and other vital institutions. The state of New Jersey, for example, will soon be testing a high-tech driver's license that can be used to pay tolls, do banking, provide medical records, and even give authorities access to fingerprints. The smart cards would contain data for a motorist's picture, signature, and fingerprints, as well as an "electronic purse" that could be used to pay for bus and train fares. The next phase would add vehicle registration and allow the cards to be used on the New Jersey Turnpike, Garden State Parkway, and Atlantic City Expressway.

A growing number of colleges and universities use debit cards for tuition payments, long-distance phone calls, meal payments to school cafeterias or outside vendors, and sporting events. The University of Michigan at Ann Arbor has about 46,000 magnetic stripe cards in circulation which can be used for identification, building access, ATM transactions, campus events, and purchases at about sixty-five merchant locations. The university's card program is

part of an alliance with First of America Bank. Only those with First of America accounts can use the cards for ATM and merchant transactions; in return, the bank picked up the cost of the merchant terminals, transaction network, and transaction processing.

Most of these existing debit cards have a limited, "closed-loop" functionality. They are meant for a single type of transaction, like telephone calls or a transit pass, or they can only be used at locations within a set geographical boundary, such as a specific university or state. Some of the major banks and credit card companies, in contrast, are attempting to create stored value cards with an open system architecture that can be used as widely as traditional printed cash or coins. Visa Cash, which debuted on a large scale in the United States at the Atlanta Olympics, is one of the most important examples.[23] The transactions processing firm, EDS, is attempting to elevate the ATM cash machine into a "merchandising" device that can sell a variety of products and services, such as prepaid phone cards, movie or theatre tickets, travellers checks, postage stamps, and "Z-cash," EDS's proprietary cash transfer service.[24]

IV. Universal Service Issues

It is already possible to see, in embryonic form, the universal service advantages and disadvantages of the new conditions. Cards have enormous capabilities to overcome the restrictions on telecommunications access created by the old technology's inextricable link between the physical access line and the account relationship. Cards also expand access by making it possible to configure the debit/credit relationship in creative ways, allowing low-income end users to establish what is to the supplier a lower-risk account relationship when they cannot establish a normal account relationship. But the cards also raise a number of worrisome possibilities about the distribution of risk, consumer lock-in, and service bundling.

A.Reconfiguring the economics of access

In his comprehensive survey of theory and empirical research on telecommunications demand, Lester Taylor observes that the demand for telephone service consists of two distinct parts, access and usage.[25] Usage is conditional upon having purchased access to the system. Generally this is reflected in a two-part tariff structure, which includes a monthly rental of an access line (often bundled with local usage) and toll charges for usage. The demand for access can be derived from the demand for usage. A person will purchase access if the consumer surplus gained from the sum of all telephone calls equals or exceeds the price of access.

Card-based access results in a dramatic reconfiguration of the economics of telecommunications demand. We need to reconsider the application of economic theory to third-generation conditions. Here are a few indications of areas where work could be done:

1. The theory of the demand for access must include a more systematic treatment of calculations of credit risk and deposit requirements. For new subscribers, especially immigrant populations, advance deposits make up a substantial part of the cost of purchasing traditional fixed-line residential access. The economic analysis of the consumer surplus derived from usage must be elaborated to take account of the fact that for many populations, usage may exceed the budget constraint. In such cases, the demand for usage comes to resemble the demand for consumer credit.

2. Users have "sunk costs" in purchasing traditional forms of access, in the form of once-off installation and connection fees. These costs can be significant in absolute terms for a low-income resident. Moreover, such sunk costs increase as a proportion of total access expenditures, the shorter the time the resident stays in one place. This is an important factor affecting the demand for access among immigrant populations, renters, and younger, less-stable households.

3. By eliminating billing costs and collection uncertainty, prepaid debit cards substantially reduce the risk of telecommunications supply. But some of this risk has simply been shifted to the demand side. End users can put down good money for service that never materializes, due to billing disputes between the card issuer and the underlying carrier, poor service by a card issuer's network, lost or stolen cards, or card expiration.

4. The notion of call externality takes on a new significance in the age of digital networks and card-based access. Thus far, cards only enhance the ability to place outgoing calls. It is not inconceivable, however, that one could prepay for the right to receive calls. Furthermore, with voice mail and other message-storing capabilities of networks and terminal equipment, users often "receive" calls by making outgoing calls. The ability to monitor where incoming calls are coming from adds another dimension to the problem. It would be nice to see economists revisit call externality in light of these developments.

5. Increasingly, the digital network detaches the consumption of access from the rental of a specific line. That is, users of credit and debit cards gain the option to place calls regardless of whether they are in a location where they have rented an access line or not. The account relationship becomes portable.[26] In terms of traditional telephone demand theory, this situation is best described as an enhancement or extension of the principle of the pay telephone. As is the case with payphones, cards enhance outgoing capabilities but not the ability to receive calls. There is no distinction between access and usage on the demand side; the two are consumed together on what might be called a "spot" basis. Usage is not conditioned upon a prior payment for access (unless one considers the purchase of the card itself as an access payment); rather, the telephone company-or an intermediary such as a drug store-pays for access and recovers the costs by making higher margins on usage. Unfortunately, according to Taylor, "the [existing] literature on the demand for coin-station service is small and unsystematic."[27] The conflation of access and usage in payphone and card-based telecommunications has important implications for universal service. It suggests the feasibility of alternative forms of telecommunications access wherein access is priced at zero and costs are recovered entirely through metered usage via debit cards. Such an arrangement is closely related to the idea of "quick dial tone" but has the added element of giving the telephone companies an incentive to maintain open lines by turning the "warm line" into a potential (and relatively risk-free) revenue source. Such limited, metered access enables greater sharing of access facilities by groups of people (since charges are made to cards and not to the account holder of the line) and a wider range of mobility for telecommunications users. This would enhance the affordability of access for extremely poor and low-usage households.

B.Prepaid Cards and Disconnection: Evidence from the U.K.

Some striking evidence of the ability of a combination of debit cards and a "quick dial tone" arrangement to reduce disconnection from essential utilities has been collected by Howard Williams of Analysys.[28] The Analysys report looks at the use of debit cards in electric and water utilities in the United Kingdom and other European countries.

In the electricity industry, customers who are in arrears are offered a prepaid electricity meter. The prepaid meters are controlled by smart cards that can have credits loaded onto them in post offices, electricity company shops, and other outlets. The system is programmed not to disrupt service if the credits run out during the night or weekend times, when it is impossible to add credits to the card. Instead, it allows the subscriber to accumulate a small debt, which is recouped the next time the card is loaded with credits. When a customer has accumulated debts, the smart card can be calibrated to charge a higher amount of money per unit of electricity than for normal prepayment.

Since the introduction of this system in 1991, the rate of disconnection of electricity customers in the U.K. has fallen from nearly 13,000 per year in 1992-93 to 1084 in 1994-95.[29] A similar scheme was introduced for water utilities in the financial year 1991-92. Residential customer water disconnections in England and Wales fell from 21,282 in the 1991-92 financial year to 5286 in the 1995-96 financial year.[30] Evidently, a society which is willing to reconfigure the account relationship between low-income users and utilities will be rewarded with major reductions in disconnection.

V.Conclusion

The intersection of universal service policy with electronic commerce is well underway. Although the drafters of the 1996 Telecommunications Act were blind to this convergence, it is not too late for the FCC to look ahead. We can identify the following as the primary areas which require additional analysis:

Distribution of Risk. For the supplier, debit cards substantially reduce payment risk and billing and collection costs, because they are based on prepayment rather than credit. There is solid empirical evidence that use of debit cards can

reduce disconnection from utilities because of this. But these examples were taken from a monopoly utility environment. In the highly competitive and fragmented U.S. telecommunications marketplace, prepayment shifts some of the risk to the consumer. Users can buy cards that don't work. Cards can expire, be lost, or be stolen. Users will face uncertainties about how and when their cards can be used, and in some cases suppliers may exploit this ignorance to extract supernormal profits on use. In part, this is simply a function of the newness of the market. But the need to protect consumers from such abuses raises significant regulatory issues which need to be addressed at the state and federal levels.

As card-based forms of electronic commerce permeate the economy, the issue of liability for fraud, now addressed by Regulation E, will probably have to be revisited. This problem, of course, transcends telecommunications policy.

Problems of Subsidizing Usage vs. Access. The natural extension of card-based access and EBT is to use cards to distribute usage subsidies to the needy. Most economists would agree that giving the subsidy to users who could not otherwise afford telecommunications makes more sense than delivering subsidies through the supplier. Supplier subsidies are not targeted at the needy but apply to anyone and everyone. They undermine efficient pricing of services. They also necessitate endless wrangles over the costs incurred by assuming a universal service obligation and the degree to which subsidies can be ported from one supplier to another. It is highly unfortunate that the 1996 Act, steeped as it is in the principles of second-generation universal service policy, commits the United States to supply-side subsidies.

On the other hand, the notion of subsidizing usage has some problems of its own. Despite the fact that most users drop off the network because of usage costs and not access costs, access subsidies fit liberal notions of equality of opportunity much more comfortably than usage subsidies. With a subsidy to access, the government is saying to the beneficiary: "Now you have (roughly) the same opportunity to communicate by telephone as everyone else. If you choose to use this opportunity heavily, you will have to pay for it. You may use the phone wisely or foolishly, but at least you have access to emergency services, schools, and job opportunities."

Subsidies to usage, on the other hand, give the subsidized party a lot more discretion. The government has little control over how the subsidized phone credits are used. Some recipients will no doubt fritter away their usage credits on unnecessary long-distance calls, 900 number services, etc. Others will carefully husband the resource. Unless the government gets into the business of monitoring communications, an alternative few citizens would find attractive, it will have to accept this fact.

Universal Interoperability. In the short term, telecom card users are likely to be confronted with a wide variety of card networks with a broad range of interoperability levels and different access modes. Card networks will overlap and compete in complicated ways. The situation is similar to the fragmentation which led to the first generation of universal service policy. Universal interoperability of card-based access methods would make life simpler for the consumer and might appear to reduce their risk of being locked into high-priced services. We must be careful, however, to balance the need for universal compatibility with the need for vigorous competition. The first-generation universal service policy was too willing to sacrifice system rivalry to achieve universal interconnection. It pinned its hopes on regulatory commissions, thinking that they could provide an adequate substitute for the price and service incentives of a competitive marketplace. We know now that regulation of market entry, exit, and interconnection can result in higher costs and lower innovation over the long term. We know now that eliminating the compatibility differences between networks can be tantamount to the elimination of competition between them. Policymakers must therefore tolerate, to some degree, strategic behavior by card-based networks that is designed to differentiate products and services. The trick is to know when and where to draw the line. Regulators cannot rule out all tying and bundling behavior as prima facie anticompetitive or anticonsumer, even though it may in fact inconvenience consumers compared to a standard of perfect competition. Tying and bundling, after all, is what networks are all about. Any attempt to eliminate them altogether is bound to lead back to regulated monopoly.

1. The Telecommunications Act of 1996 contains a new section devoted to universal service: Pub. L. No. 104-104, sec. 254, 110 Stat. 133, 253-54 (to be codified at 47 U.S.C. § 254). *See In re* Federal-State Joint Board on Universal Service, *Notice of Proposed Rulemaking and Order Establishing a Joint Board*, 61 Fed. Reg. 10,449 (1996); Federal Communications Commission, *Recommended Decision on Universal Service*, 61 Fed. Reg. 63,778, *also available in*

(last modified Nov. 21, 1996) <http://www.fcc.gov/Bureaus/ Common_Carrier/Reports/decision.html>.

2. "For decades, we [regulators] have all ordered [higher] prices on toll, business, vertical services, and certain urban residential dialtone to help pay for residential service in less dense, higher cost areas. Competition blunts and breaks these tools. Without complete reform of our universal service system, competition will eventually put universal service into a death spiral, as high volume customers move to new entrants to avoid subsidy payments." Reed Hundt, Chairman, Federal Communications Commission, to the Communications Committee, National Association of Regulatory Utility Commissioners (July 23, 1996) (visited Feb. 5, 1997) <http://www.fcc.gov/speeches/Hundt/spreh631.txt>.

3. I also find the biological overtones of the term congenial. Policies, like technological systems, have ancestors and progeny, and rise and fall over time based on their suitability to a particular technological, political, and economic environment.

4. *See* Milton Mueller, Universal Service: Interconnection, competition, and monopoly in the making of the American telephone system (1997).

5. Transportation Act of 1920 (Willis-Graham Act), Pub. L. No. 15, ch. 20, 42 Stat. 27 (1921) (codified as amended in scattered titles and sections).

6. Peter Temin & Louis Galambos, The Fall of the Bell System 24-25 (1987).

7. *See* Mueller, *supra* note 4, ch. 12.

8. Telecommunications Act of 1996, Pub. L. No. 104-104, Sec. 151, 254, 110 Stat. 56 (to be codified at 47 U.S.C. § 254).

9. Field Research Corporation, Affordability of Telephone Service - A Survey of Customers and Non-customers (1993); Milton Mueller & Jorge Reina Schement, *Universal Service from the Bottom Up: A Profile of Telecommunications Access in Camden, New Jersey*, 12 The Info. Soc. 3 (1996); J.B. Horrigan & L. Rhodes, The Evolution of Universal Service in Texas (1995); Chesapeake and Potomac Telephone Company, The Chesapeake and Potomac Telephone Company's Submission of Telephone Penetration Studies, Formal Case No. 850, District of Columbia Utilities Commission (Oct. 4, 1993).

10. A five-minute call from New York to Los Angeles using Sprint costs $1.25 for direct dial, $2.50 for a prepaid card, $3.50 for a collect call, $3.90 for a coin call, and $5.12 for an operator-assisted call. Steven A. Rosenbush, *Telecard Tussle*, Star-Ledger (Newark, N.J.), June 9, 1996, at 1, *available in* Westlaw 1996 WL 7940603.

11. *See* Flex Net Anywhere Prepaid Calling Cards, *AMCI Anywhere Telecard* (visited Feb. 5, 1997) <http://www.phonecard.com/flexnet.html>.

12. The companies are USA Calling (Atlanta), Canada Calling (Canada), TLC (New York), TeleCuba (Miami), Trans-Asian Communications (catering to Indian and Pakistani users in Manhattan), and Conetco (catering to Chinese immigrants in New York city). *See If Your Phone Card Disconnects*, Consumer Rep., Sept. 1996, at 6; Douglas Feiden, *PhoneCard Consumer Fraud*, PCM Report On-line (visited Feb. 5, 1997) <http:// www.pcmreport.com/currnews/>.

13. *See* Jim Strong, Regulatory Analyst, Florida Public Service Commission, *Regulation of Prepaid Telephone Cards in Florida*, PCM Report On-Line (visited Feb. 5, 1997) <http://www.pcmreport.com/currnews/curr064.htm>.

14. *Id*.

15. *Comtel Launches Daily Metered Billing Service* (visited Feb. 5, 1997) <http:// www.comtel-debit-tech.com/press/press03.html>.

16. Narisa Chu, Presentation at Rutgers University (Nov. 19, 1996).

17. The cellular company Metro 2000 offered a promotion called "Cellphone in a box" at retail outlets such as K-Mart during the holiday gift season. The delinquency percentage increased to 20%. *Id*.

18. Wanda Cantrell, *The Coming Free-for-all in Calling Cards*, Credit Card Mgmt., Sept. 1991, at 68, 68-72.

19. *USTA Warns Consumers of AT&T's Decision to Cancel Mutual Card Honoring Agreements* (visited Feb. 5, 1997) <http://www.usta.org/rls96-22.html>.

20. Paul Taylor & Tom Foremski, *Smart Cards' Time Has Come*, Fin. Post, Oct. 26, 1996, at C20.

21. Richard Mitchell, *Electronic Welfare's Big Year*, Credit Card Mgmt., Mar. 1995, at 16-17.

22. Local governments fear that if the $50 limit is applied to EBT, EBT cards and access numbers will be traded for cash in an underground market, and the economic benefits of EBT will be more than offset by losses to fraud. This position has the support of the National Association of Counties, the National Governors Association, and the American Public Welfare Association. But the Federal Reserve Board and the Consumers Union see application of Regulation E to welfare as an equity issue; i.e., the same regulation should apply to all members of the public regardless of whether they are on public assistance. Brian Miller, *Regulation E Threatens Welfare EBT* (visited Feb. 5, 1997) <http://www.govtech.net/ 1995/gt/jan/ebt.shtm>.

23. *Visa Chip-Based Stored Value Card Products Offer Cash Alternative to Consumers*, Visa Expo (visited Feb. 5, 1997) <http://www.visa.com/cgi-bin/vee/vw/news/PRelco032395. html?2+0>.

24. Interview, EDS Electronic Commerce Division, in Morris Plains, New Jersey (Nov. 20, 1996).

25. Lester D. Taylor, Telecommunications Demand in Theory and Practice 9-10 (1994).

26. But this is true for outgoing calls only. So far, card-based access has done little to make the option to receive calls portable across facilities and networks.

27. Taylor, *supra* note 25, at 332.

28. *The Future of Universal Service in European Telecoms: Provision of Public Telecoms Services in the Context of ONP*, Draft Final Report for EC DGXIII/A1, Analysys Report No. 96215 (Aug. 2, 1996).

29. *Id*. at 59.

30. *Id*. at 61.