Universal Service: A New Definition?

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ABSTRACT

The concept of “universal service obligation” (USO) has been around for decades; however, its definition continues to change. The notion that the last mile of fixed line access should be subsidized has spread around the world, despite well reasoned arguments and empirical evidence that the policy is and was a failure. It created artificial competition. Now the concept is becoming bifurcated. Should wireless and/or broadband services be included in the definition of universal services? This paper is in two parts: What should constitute USO definitions and how, if at all, it should be implemented. Many consumers are “cutting-the-cord” and moving directly to alternative services. In this ubiquitous communications environment the whole set of possible communications methods should be considered when defining “universal connectivity.” Second, no one service or technology should be relied on to support subsidies.

The second part of the paper addresses the policy question: How should this connectivity be achieved?

Keywords

Universal service/access/connectivity, auctions, pricing policy, subsidy

OVERVIEW

Current environment

Imagine sitting in your local Starbucks (not the other Starbucks three blocks away) with your computer operating on Starbucks’ WiFi network. You receive an e-mail from a friend, so you decide to call her by activating your voice over internet protocol (VoIP) software on your computer. She answers on her mobile, but wishes to call you back on a landline because of the high roaming costs in Asia on her mobile. You did not even realize she was out of the country! She used her AT&T Direct card to call you on your home phone, which was forwarded to your mobile phone. You forgot to tell her you were not at home (where you would have used your cable modem to make the VoIP call).

This “simple” call went from the wireless WiFi network to the ISP which carried the data to a VoIP gateway service provider which sent the call over an internet backbone to a gateway in Asia which routed the call into the Asian PSTN, which sent the call to a mobile service provider which has an arrangement with your friend’s mobile service provider to deliver calls to its
customers when the United States mobile customers are in its cellular territory. This is the world’s largest computer in action. Not only does the data/call physically traverses all of these various networks, but also the companies involved get paid and are able to bill the appropriate entity. Every leg in this transmission expects some compensation for carrying the data/call.

Moreover, when she calls you back, the Asian telephone company receives compensation from AT&T; it also compensates the local exchange carrier who in turn compensates the mobile carrier. Your mobile carrier will bill you for the call later in the month; AT&T will bill your friend at the end of the month. So it goes. In today’s world of communications, a call is no longer simply a signal sent over a fixed line to a receiver at another fixed line, but a multitude of means of carrying a call are available. And, if we consider data communications the choice set becomes even larger. Thus, the definition of universal service obligation must be expanded.

The concept of “universal service” or “universal service obligation” (USO) has been around for decades; however, its definition continues to change. Initially it was a marketing slogan used by Theodor Vail of the Bell System in the United States. It evolved in the nineteen-seventies to mean either low priced access to the telephone system or subsidized access to the system. This was part of the campaign of the Bell System to prohibit or inhibit competition in the long-distance market.\(^1\) The campaign failed, but the concept remained. The notion that the last mile of fixed line access should be subsidized has spread around the world, despite well reasoned arguments and empirical evidence that the policy is and was a failure.\(^2\) It created artificial competition – “competitors” which were arbitrage plays – because of the distorted rates in long-distance service required to provide subsidies for the universal service obligation. The meaning of the term blurred again with the passage of the 1996 Telecommunications Act in the USA, when schools and libraries were included in the subsidy set. Now the concept is becoming bifurcated. Should wireless and/or broadband services be included in the definition of universal services?

This paper is in two parts: What should constitute USO definitions and how, if at all, it should be implemented.

The USO becomes more difficult when one asks: What is the purpose of any USO? It is (or should be) to provide communications service to those who would not otherwise have it available to them when priced at the true market cost of provision. When the definition is cast in this manner, it becomes technologically and service neutral, which it should be in today’s communications environment. Mobile telephone service, as well as a variety of other wireless services, provides consumers with communications that serve as a substitute for the traditional fixed-line telephony. Indeed, many consumers are “cutting-the-cord” or skipping the fixed line service altogether and moving directly to cellular phone service.\(^3\) Then consider that the provision of broadband, in addition to e-mail and web surfing, allows for voice over internet protocol, instant messaging and even two-way video. And, the broadband connection need not be connected to a fixed line. The broadband could come from satellite, WiFi, WiMax or other wireless system. The need for a traditional landline is not a requirement to communicate! Thus, no distinction between the functionality of the traditional or fixed line telephony and these new methods should be made for purposes of the consumers communicating. Indeed, these new methods of communications have advantages over the traditional form, such as mobility or data transfer. This has several implications: the two most important are, first, that the whole set of possible communications methods should be included when considering “universal connectivity.” Second, no one service or technology should be relied on to support subsidies. This will distort market prices and lead to inefficient arbitrage of the services, just as had occurred in the long-distance markets in the United States, United Kingdom, and other countries. Thus, what we argue in the paper is that the definition of universal connectivity should be as inclusive as possible and, a corollary, that any subsidy should not be placed on any one service or technology to the exclusion of others. After briefly exploring the range of technologies to communicate, the first section of the paper develops this argument more fully based on the authors’ and others’ research in the United States environment.

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1 The Bell System, also known as AT&T, at the time. In 1984 it was divested into seven regional operating companies known as the “Baby Bells” with AT&T as the long-distance company. Since then through mergers and consolidations only three major companies remain: AT&T, Verizon, and Qwest.

2 For history and analysis of universal service, see Mueller (1997) and the reference cited therein. Crandall and Waverman (2000) show the social cost of the policy and Alleman and Rappoport (2000 & 2003) indicate the impact of the policy on various segments of society in the USA and suggest alternative means of achieving the objectives.

3 See Rappoport and Alleman (2009). They estimate the number of consumers in the USA who have cut-the-cord. Many countries now have more mobile phone subscribers than fixed line subscribers. In rural areas mobile penetration can be nearly three times as great as fixed line service (International Telecommunication Union, 2006). Also see Rappoport, et al. (forthcoming) for an estimate of the demand for wireless internet.
The second part of the paper addresses the policy question: How should this connectivity be achieved? We propose a methodology to determine when a subsidy should be provided, how it should be financed and at what level. Our criteria suggest that the policies are service and technology neutral, cost effective and efficient. While much of our data comes from the United States experience, we believe it offers general guidelines for other countries, particularly if a country is resource constrained.

A brief note on technology and trends

As indicated above communications technologies have evolved significantly in the last few decades. We will note a few of these changes to set the framework for the arguments we develop.

The most obvious substitute for traditional fixed line telephony is the cellular mobile service. This development is well documented. For a number of years, there have been relatively ubiquitous voice services available to consumers over GSM, CDMA and iDEN networks in the United States. The coverage and availability of mobile voice networks, however, has not been matched by similarly ubiquitous capabilities for data transport and internet access. While there have been a number of efforts, using 3G technologies, to provide such data services, these are lacking to some degree – either in terms of ubiquity of coverage or data throughput speeds. Several providers are now looking to new technologies that can potentially fill this gap – most notably WiMax (IEEE 802.16) which is now being deployed by Sprint/Clearwire in the 2.5 GHz band. In addition, the 700 MHz band in the US is being touted as a potential platform for new wireless internet access services.

In the rest of the world, the fixed line services are being replaced by cellular mobile technologies. Figure 1 shows the extent of this substitution. It shows the ratio, from high to low, of mobile phone over main-line telephones for over 200 countries. Mobile phones exceed main lines in 200 countries; in 166, mobiles are twice the main-lines. Clearly, in many countries, this is a direct substitute for the fixed line phone; indeed it has features that the fixed line cannot offer, the most obvious being mobility, but it can be less expensive than fixed lines: available where fixed line is not; can provide data/internet services; allows banking, etc. Thus, as the best candidate for connectivity, it would be the mobile phone. What may be less obvious is that some wireless phones can bypass the traditional PSTN. In the United States, Vonage, T-Mobile and other companies offer a WiFi phone that can be used on a broadband network to make calls over the internet. Skype is a service which offers connectivity between the consumer’s computer and the PSTN. It provides international service at a fraction of the rate of traditional international calls. Now Skype is available on mobile phones. Nokia offers a mobile phone which provides VoIP service for international calls.

Thus, not only are there alternative technologies to carry the calls (and more than calls), but many alternatives to avoid the traditional public switched telephone network (PSTN). This implies that the traditional sources of cross-subsidies and high margin business are eroding. Not only will prices have to align closer to costs, but cross-subsidies cannot be maintained. We will return to this point later in the paper. These alternatives are general, outside the control of the legacy telephone companies, but also beyond the reach of the regulatory authorities. Table 1 summarizes the alternative technologies and their characteristics.

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4 While the authors assume for the purposes of the paper that universal connectivity is a desired policy goal, it is not at all certain that this goal is the most efficient use of a country's resources. We address this issue in Alleman, et al. (2008).

5 The public switch telephone network (PSTN), the traditional fixed line telephone network or simply the traditional network all refer to the pre-wireless, pre-internet legacy network which the older among us grew up with. In this paper we will use these terms interchangeably.
UNIVERSAL SERVICE ISSUES

Market boundary

In addition to the new economics, the convergence of the industries must also be addressed in the new analytic framework. No longer can the cable, broadcasting, telecommunications and internet sectors be viewed in isolation. Cellular mobile telephony is replacing the fixed line telephone in many locations. (In the developing world, consumers are moving directly to mobile phones, bypassing the fixed lines altogether as shown in Figure 1.) Many mobile phones are complements or substitutes for wireline access to internet: e-mail, web surfing, movies, photos are now available on most mobile phones. Not only are mobile phones becoming more sophisticated, they are becoming “open source” as is the internet with the resulting promise of yet unthought-of applications and innovations. Other wireless services such as WiFi and WiMax are threatening the traditional fixed line and cable services. Voice and video services of all types are carried over the internet; telephone companies are encroaching on cable and satellite television markets and vise versa. Even the print media is suffering from the internet erosion of its time-honored markets. Advertising of all types is moving to the internet, and to mobile devices. Other news sources are available on the web from traditional news sources, alternative sources such as The Huffington Post, and unconventional sources such as blogs and twitters. Moreover gaming and social networks are eroding viewers’/consumers’ time for traditional media – newspaper, magazines, books, and television viewing. Market boundaries are no longer clearly defined; however, for purposes of USO one needs to clarify if and when universal service objectives are achieved. We define it in terms of functionality – neither technology nor service, but function. Clearly, definitions and tools need to be developed to define and describe this convergence of products and services.

Table 1. Functionality of Technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Voice</th>
<th>Data</th>
<th>Video</th>
<th>Mobility</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Fixed line</td>
<td></td>
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<tr>
<td>• Twisted-pair</td>
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<td>X</td>
<td>Limited</td>
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<td>High</td>
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<tr>
<td>• fiber</td>
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<td>• Cable</td>
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<td>• WiFi</td>
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<tr>
<td>• WiMax</td>
<td>X</td>
<td>X</td>
<td>Limited</td>
<td>X</td>
<td>Moderate</td>
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<tr>
<td>• Satellite</td>
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<td>• ...</td>
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An uncertain market boundary also has an impact on such concepts as “dominant market power” which is used as a guideline for antitrust, regulation, or legislative intervention.
Several issues arise out of the consideration for universal service. In the rhetoric surrounding the discussion these get obfuscated or lost. The first is: “Should there be a USO policy at all?” Here the arguments concern equity, impact on economics development, necessity for the infrastructure, etc. However, the essence of the argument is “Is there a market failure in the provision of communications services?”

We take the position that in developed countries, externalities do not justify a USO policy. With 95-98 percent penetration of voice services, any other additional subscribers are not going to enhance gains from externalities. Any market failure revolves around market dominance. That is, the markets in general are not regulated by market competition, but the regulators have abrogated their responsibilities under the pretence that they are. Thus, no USO policy is required, but a more vigorous regulatory approach is required.

In developing countries, the situation is not clear cut. Due to low penetration, the externalities have a role in consideration of USO policy. Additional subscribers can collectively impact social welfare more than the value to the individual consumer. That is, the gain in welfare is greater than the consumer gain from purchasing network access. That said, it does not indicate how it should be implemented or financed. Nor what technology or service should be promoted.

The emerging issue is “What should be included in the definition of USO?” The definition is moving beyond defining USO as simple voice connectivity to a definition which includes data transmission, even broadband connectivity. Again, however, the question of market failure is raised. In the United States the new Obama Administration has assumed this is the case and is pumping $US 7.2 billion into broadband deployment. This is the principal issue of this paper: “What should be included in the definition of USO?” What we have hinted at above is that the definition should revolve around the notion of “connectivity” That is, whether a mobile phone, a fixed line, a WiFi/WiMax at home, or any other technology which allows an individual to communicate with the rest of the world should be counted as coverage in a USO metric. The corollary to this is that no one technology or service should either be provided with a subsidy or generate a subsidy – not only does this tilt the playing field in favor of one party or another, it does not allow the most efficient technology to prevail. One service or technology is either handicapped or benefited.

The definition is moving beyond defining USO as simple voice connectivity to include data and video connectivity. Should this connectivity be with broadband? This is a more nuanced question. Many have argued, including the current United States administration, that broadband connectivity is critical to infrastructure in the information age. It is vital and necessary to a vibrant and robust economy. It is vital to economic growth and development. While we are sympathetic to these arguments, both in the developed and developing world, we have not seen evidence of a market failure in the provision of broadband.

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Figure 1. Mobile versus main-line penetration worldwide

Need for and definition of universal service

Under the American Recovery and Reinvestment Act
Assuming the policy makers decide to employ a universal service policy, then the question is: “How should it be implemented?” Here we are quite explicit, we feel that it should be targeted to the marginal subscribers who would otherwise not take the service, but realize that this has significant political hurdles to overcome. The second part of the question is what companies/technologies should receive grants/concessions? Here too, we are explicit as to the vehicle to determine the provider – auctions. We would be technologically neutral, but not financially neutral. The provider who promised a specific level of service for the lowest cost would be the “winner” of the auction. As indicated before, the funds to support the winner would come from the government.

Assuming the policy makers decide to employ a universal service policy, then the question is: “How should it be implemented?” In the case of the Obama Administration, this has not yet been determined. We hope that the suggestions in Part II of this paper will be considered by the administration.

This leads to the final, overarching issue: “How should it be financed?” Should it be through cross-subsidies on the rate structure? Direct grants by the government? To the telecommunications companies? To the end-user consumers? Unfortunately, the issues get confounded in the discussion. We argue that for equity and efficiency purposes, but most of all for democratic principles, that the government fund the program through general tax revenues. In the case of the Obama administration, direct grants has been the chosen vehicle, in part, because of is stimulation effect in the current economic downturn. We support this type of funding because of it efficiency and equity impacts and the democratic principles.

We now turn to the demand side considerations and empirical observations from the United States perspective.

DEMAND SIDE

Willingness to pay (WTP) for wireless

With the recent auction of the 700 MHz spectrum in the United States, speculation has focused on the deployment of new and more comprehensive high speed wireless services. In this section we look at research on the emerging market for high speed wireless broadband. What is the willingness-to-pay (WTP) for these services and devices? What is the distinction between those willing to pay and those unwilling to pay for high speed wireless access? As 4th generation networks are deployed, does broadband represent a substitute or a complement to current high speed internet networks such as DSL, cable modem and fiber?

To provide insight into the market potential for wireless data and internet services, Centris initiated a study of “willingness-to-pay” for a ubiquitous wireless internet access (UWIA) service (think wireless broadband services). As part of this effort, it has ascertained: How many internet households would be willing to pay at least a reasonable amount ($20 per month) for UWIA and computed price elasticities for UWIA service.

Out of the 113.85 million households survey, only those currently with an internet connection were examined. The potential UWIA market was defined as online households willing to pay at least $20 or more per month – Rappoport et al. (forthcoming) estimated that there are over 15 million such households across the United States – a significant market worthy of attention. Thus, the overall market for UWIA can be valued at $9.1 billion annually. Those willing to pay for UWIA report that they are willing to spend, on average, $47.60 per month, although it is not clear, at this time, whether these potential buyers are seeking UWIA as a substitute for existing internet capabilities or whether they view it as an adjunct to services for which they are already paying. The study found that since interest in UWIA is driven by a cluster of internet-related activities and purchases, growth in broadband in the home will likely lead to a larger market for UWIA – thus as broadband penetration increases, potential interest in UWIA should also increase. What this research suggests to us is that UWIA should not be ruled out as a USO candidate. We now turn to using cellular service as a direct substitute for traditional fixed line telephone service.

Cutting the cord

A number of papers have explored the substitution between fixed and wireless access in the US. A paper by Roini, Ward and Woroch (2003) found that the cross-price elasticity between fixed access and wireless was 0.18. However, their paper could not distinguish whether substitution was on second lines or for primary lines. Shelanski (2005) reviews the evidence supporting the shift from wireline to wireless service. He noted that the penetration rate of households with a cell

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8 Also see Hausman (1998) who make the same case for direct financing by government and targeted.

9 This is the results of a larger study by Rappoport et al. (forthcoming) using Centris data.
phone is over 60%, there has been a continuous decline in long distance calls and minutes made by landline phones and a corresponding increase in long distance calls made over cell phones, and households receive over half of their calls wirelessly. Pociask (2004) estimates the demand for wireless service (measured by wireless subscribers) and finds statistically significant cross-price elasticity between the price of wireline service and the demand for wireless service. His model, however, does not distinguish between primary and secondary line substitution.

Rappoport et al. (2003) estimates the demand for wireless access to the internet. This study provided evidence that the demand for wireless services was strongly linked to the demand for broadband service.

Zimmerman (2006) looks at wireline-affiliated wireless carriers (e.g. Cingular/AT&T wireless merger) and notes that wireless providers (Cingular and Verizon) designed their strategies to mitigate the extent of wireline-to-wireless substitution. Such strategies include offering ‘integrated’ wireline and wireless services, allowing subscribers to share free long-distance minutes and providing wireless docking stations which allow incoming calls placed to a mobile handset to be answered on any of the subscriber’s wireline sets. Zimmerman provides a minutes threshold for estimating whether a household would cut the cord. He found that wireless usage of approximately 1065 minutes per month would induce cord-cutting. The implication is to discourage cord-cutting is to offer plans with fewer minutes.

The PEW (2006) Internet Survey found that those who have given up their land lines and only use cell phones are a ‘breed apart.’ They found, inter alia: Among respondents, this subpopulation is disproportionately male, under age 30, nonwhite, unmarried, and from households with modest amounts of income (households earning less than $30,000) and the devotion of cell-only users to their phone is pronounced: 81% of cell-only owners say they leave their phone on all the time, compared to 48% of those who have both cells and landlines who say the mobile phone is on all the time.

Rappoport et al. (2009) had an alternative approach for estimating the number of households that have dropped their landline connection in favor of a wireless connection. The paper provides a methodology for estimating the number of ‘cord-cutters’ for local areas. From a national perspective, evidence clearly points to the growing number of “cord cutters”. This trend notwithstanding, there has been little research into the demand for wireless only access. Further, there is limited information on geographic distribution of wireless-only households in the United States.

The growth of wireless telephony with the increasing set of features and capabilities included in wireless services raises a number of issues. The first concerns the nature of intermodal competition and regulation. The second focuses on understanding the demand for telephony services. The study of both issues requires the ability to estimate the size of the wireless-only market. Moreover, the trend towards cell-only households is important because it impacts a number of regulatory issues ranging from the discussion and measurement of local loop competition to the funding of universal service obligations.

Overall, we see these research results as reinforcing our argument that the definition of USO should be as broad as possible and not limited to any particular technology or service.

AUCTIONS

As we indicated for the purposes of this paper, we will assume that policy makers wish to continue to promote USO. Based on the earlier discussion, we suggest that the policy makers set the parameters for connectivity i.e. speed, quality of service, other non-price attributes of service, etc.

In this section we propose the use of auctions for determining which firms should undertake a universal service obligation, and what compensation they should receive for performing this function. The auction would reveal the firms’ valuations of the USO, determine the number of USO providers endogenously, and provide an alternative to traditional cost-of-service regulation or beauty contests.

In an earlier proposal GTE suggested that a process of competitive bidding could serve this purpose. The policy maker or regulator would define the market intervention it wished to impose in the form of a universal service obligation. An auction

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10. We use the terms wireless, cell and mobile service interchangeably in this paper.

11. We draw on Alleman and Rappoport (2000) for the discussion in this section.

would then determine which firms should undertake this obligation and the compensation those firms should receive in return. An auction framework for this purpose was developed for traditional USO, but it would serve equally well in the current environment (Milgrom 1996). This section describes the specific auction mechanism developed. Competitive bidding has been used by governments for many years to procure products and services – to choose the most efficient supplier, and to ensure that the government obtains the most advantageous price. Auctions have also been employed to assign rights to government-held resources, such as spectrum or offshore oil deposits – to direct these resources to their highest valued use, and to maximize the resulting revenue. Auctions are particularly useful in valuing items for which it would otherwise be difficult to establish a price – because of their novelty or complexity, or because of the lack of observable market prices for comparable items. In this case, the “item” to be auctioned is an obligation to supply service to customers, but at prices, terms, and conditions the firm would not have chosen voluntarily.

To summarize the framework set forth, we will propose that the policy maker should first define the universal service obligation it wishes firms to undertake. We also define the market area for which this obligation would be assigned, suggesting that these should be relatively small, standard geographic areas. The universal service obligation for each small geographic area should be put up for auction when one or more of the firms nominates that area for bidding. Repeated auctions over time allow this framework to adapt to changes in technology, costs, or policy objectives.

**Why an Auction?**

Most of the discussion about universal service, in the United States and elsewhere, has focused on estimating the cost of the basic service, and deriving support levels by comparing this cost to some estimate or assumption regarding revenue. Compared to this alternative, an auction offers a number of advantages over traditional approaches as a means to select universal service providers, and to determine the level of support payments.

**Advantages of an auction?**

The application of auctions to universal service obligations has at least three advantages: Speed, revelation of firms’ valuations and preventing collusion. We address the first two, the last is obvious – it prevents dishonest dealing between the seller’s agent and the buyer (here, the buyer’s agent and the seller).

With respect to speed of sale, competitive bidding offers a means to settle long-standing regulatory controversies, and allows an effective universal service mechanism to be put in place. Explicit funding would associate revenue with the provision of the service, which would compensate firms for the costs of providing it. Until this can be done, entry into markets will be blocked economically; namely, new entrants would not find these markets economically viable. Delay in correcting these price signals will be costly, in the sense that efficient development of competition in these markets will also be delayed.

Auctions provide a means of revealing firms’ valuations of the universal service obligation itself. The current process has been lengthy precisely because it has proven extraordinarily difficult for policy makers to determine these valuations through traditional means. Competitive bidding obviates the need for the regulator to make such unappealing choices. Each bid will reflect the bidder’s own expectations with respect to costs as well as revenues. Further, bidders will also consider any other factors they may find relevant, but which the traditional approach cannot include. For example, if the policy maker/regulator establishes a quality requirement for universal service that the firm would not choose to meet in the absence of the obligation, or if dealing with the regulator is burdensome, the bid would reflect the firm’s assessment of these factors. On the other hand, there might be some benefits to a firm, other than the revenue itself, associated with the universal service obligation. These might include any demand complementarities between basic service and other services the firm might offer, or perhaps some increased brand recognition that might result from official designation as a universal service provider. One of the great virtues of an auction is that there is no need for the policy makers to assess the likelihood of any such factors, positive or negative, or their relative magnitude.

**CONCLUSION/RECOMMENDATIONS**

The major distortion in the telecommunications industry has been universal service, or the subsidization of subscribers’ access to the network. This paper has shown that universal service is inefficient as a means of obtaining its intended goal.

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13 We use the term “firms” rather than carriers because we want to emphasize that the bidding would not be restricted to traditional or cellular carriers only, but any firm that could meet the requirements.


15 See Alleman and Rappoport (2000) for examples.
Because it is not directed to the marginal subscribers, it is costly to support; because it is not targeted directly to the needy subscribers, it misses its goal. Fundraising through cross-subsidies from other services is counterproductive – higher prices for the services providing the subsidies reduce the demand for subscriber access from the group which it is intended to aid. The subsidies inhibit effective competition because of artificially low prices for subscribers’ access, and high prices for other services, thus preventing the market from testing the efficiency of the provider. This can lead to inefficient entry in the high-priced markets and preclude efficient, low-cost entry in the subsidized markets. This is incompatible with competition policy. If a democratic process determines that subsidies are desirable, these should be targeted to the end-users and funded directly through government. While the myth of universal service obligation – as currently embedded in regulatory policies – is without economic foundations, universal service arguments nevertheless continue to plague the communications industry to the detriment of business, the public and potential competitors. The issue should be re-examined in light of the criticisms above.

Auctions provide a method for policy makers to reconcile their desire to promote competition with their continued commitment to universal service. Competitive bidding is a market mechanism for deciding which firms should provide universal service, and how much they should be paid for doing so. Many of the current efforts to reform telecommunications policy have only created more legal and regulatory disputes; oddly enough, a process that began with a desire to rely more on markets, and less on regulation, has in fact given cost-of-service regulation a new lease on life. Competitive bidding provides an approach that is more likely to reveal the amount of universal service support accurately. This is important not only to ensure that the universal service policy is sustainable, but also to correct the current distortions in relative prices, so as to provide incentives for efficient entry and investment decisions. Finally, by revealing information about the most effective market structure, the auction itself provides a mechanism for the transition to competition.

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